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No. 1277



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MAJOR CROP PROGRESS AND WEATHER REPORTING

MEASURES EMPLOYED FOR RAISING WINTER GRAIN CROP YIELDS IN ROSTOVSKAYA OBLAST

Moscow SEL'SKAYA ZHIZN' in Russian 19 Mar 81 p 1

[Article by Yu. Maksimenko, Rostovskaya Oblast: "Increasing the Return From the Winter Fields"]

[Text] The main grain fields in the Don River region are the winter grain crops. Last year they were sown on 2.3 million hectares. In early March, a committee of specialists carried out a thorough inventory of the crops in the rayons. For the most part, the crops endured the winter rather well. The supply of moisture in the soil is sufficiently high. Thus, fine prerequisites are being created for the development of the winter grain crops.

But there is no basis for complacency. The farmers are aware that high yields can be obtained only if active work is performed out on the fields and the entire complex of crop tending measures is carried out. During recent conferences held for specialists, the tactics for carrying out the field work were developed taking into account the peculiarities of this year's spring period. The agronomists and machine operators are presently engaged in implementing these tactics.

At the Pamyat' Kirova Kolkhoz in Kagal'nitskiy Rayon, 45-50 quintals of wheat per hectare are being obtained annually. The agricultural service headed by I.P. Ocheret has drawn the conclusion that the extended growing season for the winter grain crops has increased the consumption of nitrogen by the plants. Thus, there is not enough nitrogen nourishment available for their normal development during the spring. And this cannot be tolerated. No sooner had the soil matured than units consisting of mineral fertilizer spreaders began moving out onto the fields. Over a period of 3 fine days, the machine operators succeeded in applying a top dressing to 800 hectares of crops. In the spring, every hectare of winter grain crop is given mineral nourishment and it is sufficient for laying in good ears.

The experience of farmers at the Pamyat' Kirova Kolkhoz has proven that a maximum increase in the grain yield from winter crops can be obtained from top dressings applied to the plantings during the growing season: in the autumn, a surface top dressing at the rate of 1 quintal of nitro-ammophos per hectare and in the spring -- on slightly frozen soil (using RUM's [mineral fertilizer spreader]) ammonium nitrate is applied at the rate of 1 quintal per hectare and on mature soil -- again, on quintal of saltpetre per hectare.

Following the example of leading farms in Kagal'nitskiy Rayon, specialists attached to the production administration, kolkhozes and sovkhoses, in collaboration with scientists at the Don Plant Breeding Center, have developed and are employing a complex of agrotechnical measures for tending the winter grain crops. Fertilizer has already been applied to 39,000 of 43,000 hectares in the form of top dressings. Use was made of aircraft of agricultural aviation and also ground equipment. Many of the crops will be given surface top dressings. Mineral fertilizer distributing units have been prepared for this purpose. Everything is in a state of readiness; just as soon as the soil matures and without waiting for a mass build-up of work, the selective "repairing" of crops damaged by agricultural pests will commence.

Highly productive use is being made of the equipment for applying top dressings to the winter grain crops on many farms in Sal'skiy, Peschanokopskiy, Tsimlyanskiy, Morozovski, Myasnikovski and Ust'-Donetskiy Rayons. Economies in working time are being realized through the continuous loading of fertilizer into the hoppers of the transport vehicles. Based upon the experience of leading farms, a definite system has been adopted for applying top dressings to the crops depending upon their condition: first of all -- well developed crops that are not overgrown and thereafter -- winter crops which were grown following non-fallow predecessor crops.

More extensive use will be made of the progressive surface method for applying fertilizers to the soil. This method was employed for applying a top dressing to the first 112,000 hectares of winter grain crops. Overall, it will be used for applying mineral fertilizer to almost 1 million hectares. At the Kolkhoz imeni XXII Parts'yezda in Sal'skiy Rayon, the fertilizer is placed in the rows at the greatest possible depth -- up to 6 centimeters which, when the soil is sufficiently loose, replaces harrowing for the winter crops. In order for the fertilizer to become mixed well with the soil, rings are attached behind the disks or leveling chains behind the spreader. It is believed that this experience will have its followers on other farms.

In recent years, considerable damage has been inflicted on the crops by agricultural pests and especially by the grain beetle. This year it damaged a portion of the winter grain crops in Azovski, Yegorlykskiy, Tselinskiy, Kuybyshevski and other Rayons. Are the associations of Sel'khozkhimiya prepared to carry out work on the crops at kolkhozes and sovkhoses in connection with destroying these pests? It has been discovered that not all areas as yet have the required quantities of pesticides available and a portion of them are still located outside the oblast. A delay can be very costly for the future harvest.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

KURGANSKAYA OBLAST GRAIN SUCCESSES, FUTURE PLANS DISCUSSED

Moscow SEL'SKAYA ZHIZN' in Russian 12 Mar 81 p 1

[Article by I. Shevchenko, Kurganskaya Oblast: "Field Reserves in Trans-Urals Region"]

[Excerpts] The agronomic service in Kurganskaya Oblast is intensifying its operations. The experience of leading workers to be made available to all farms! The farmers in the Trans-Urals region are competing to obtain 20 quintals of grain per hectare and to increase the production and procurements of all types of agricultural products.

The farmers in Kurganskaya Oblast have achieved fine successes in their production of grain. During the years of the past five-year plan, they produced an average of 3.2 million tons of grain. But the requirements are increasing. There is every reason to believe that during the next few years the oblast's farmers will harvest no less than 3.9 million tons of grain and obtain 21-22 quintals from each hectare.

Analysis has revealed that such opportunities are available. The Kurganskaya Oblast kolkhozes and sovkhoses have at their disposal more than 3 million hectares of arable land, of which amount 1.85 million hectares have been set aside for grain and pulse crops and 15 percent is annually being "repaired" in fallow fields. The principal tilling of the soil is being carried out by more than 11,000 heavy tractors, including more than 3,000 Kirovets machines. The farm fields are being supplied with 6.5 million tons of organic materials and in excess of 300,000 tons of mineral fertilizers. An orderly system has been created for the production of elite seed and seed of the first reproduction. The best technological methods are known, those which make it possible to obtain high and stable yields.

During the years of the Tenth Five-Year Plan, the average cropping power for Kurgan grain crops increased by 4.5 quintals. Last year it amounted to 19.1 quintals. The oblast is presently producing more than 1 ton of grain for each hectare of arable land. This is one of the highest indicators between the Urals and the Maritime Region. Individual rayons and farms have achieved even greater results. Shadrinskiy Rayon obtained 24.2 quintals of grain per hectare. Safakulevskiy Rayon -- 23, Shatrovskiy -- 21.5, Kargapol'skiy, Ketovskiy and Shumikhinskiy Rayon -- more than 20 quintals per hectare.

The successes achieved by leading workers were considerable. They are defining the main direction and the principal path to be followed for the further development of

farming. But in the oblast there are still 52 out of 387 farms which are still unable to achieve a cropping power in excess of 16 quintals.

In response to the decisions handed down during the 26th CPSU Congress, this year's goal is as follows: to obtain 20 quintals of grain per hectare throughout the oblast as a whole and to sell no less than 1.65 million tons of it. A considerable amount of work has been carried out in this regard. The fallow land and autumn plowed fields have been prepared, high quality seed has been procured, a considerable quantity of fertilizer has been applied and other reserves have been placed in operation.

These reserves were discussed at length during a conference held for the oblast's agronomists. Specific methods were cited here for increasing the production of grain, feed, potatoes and vegetables. A discussion took place during the conference on improving the organization of production and making proper use of fertilizers and the highly effective agrotechnical methods to be employed this spring. In particular, the chairman of the Rodina Kolkhoz in Katayskiy Rayon, V.I. Ovsyannikov, proposed that a decisive campaign be waged against weeds, which are depriving the oblast's farms of many thousands of tons of grain. A scientific experiment carried out on the farm underscored the benefit to be derived from sowing grain crops in a non-fallow crop rotation plan, prior to alternation according to the arrangement fallow - wheat - barley. Importance is being attached to increasing the role played by mineral fertilizers. For example, in order to obtain 35 or more quintals of grain per hectare and in addition to a high culture of soil cultivation, no less than 100-120 kilograms of active mineral fertilizer must be applied to the soil. Last year the kolkhoz applied 140 kilograms per hectare and it obtained, as already mentioned, more than 42 quintals of grain.

The chief agronomist at the Rossiya Kolkhoz in Shatrovskiy Rayon, A.T. Nelyubin, considers an expansion of the pulse crop plantings to be a considerable reserve for raising the cropping power of the agricultural crops. As a result of action taken in this regard, the farm obtained an average of 30 quintals of grain during the five-year period.

Measures are being undertaken throughout the oblast aimed at further improving feed production, the cultivation of groat crops and the construction of a base for the grain economy.

The farmers in the Trans-Urals region are presently responding to the decisions handed down during the 26th party congress by carrying out their field work in an active manner. The farms have completed their work of raising their spring crop seed to a high condition. Many kolkhozes and sovkhoses, in continuing this work, are improving their seed to 1st and 2d class quality. An increasing number of repaired tractors are departing the workshops. The leaders and specialists are defining more precisely their working plans for carrying out the spring sowing work as rapidly as possible and in a high quality manner.

MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

SEVERE ICY CONDITIONS--Leningrad--Yesterday, an unusual appeal was made to the residents of the city over the local radio broadcasting network: a committee for combating natural calamities requested elderly persons and children to stay off the streets and for the owners of private motor vehicles -- to leave them in their garages. Leningrad was beset by unprecedented icy conditions. The roar of special machines has continued without abatement for 2 days out on the city's streets: machines for spreading sand and bulldozers for cutting through the icy crust. Emergency brigades are correcting breaks in the cables of the contact network. The housing offices have mobilized the active membership for the purpose of spreading sand on the walkways. The guilty part is a natural phenomenon -- an icy rain -- the likes of which has never before been recorded in the annals of the local weather service. Strong frosts had prevailed in Leningrad for several days and yesterday a warm cyclone burst through from Scandinavia. Rain fell from out of the clouds that brought in sea air and a plus temperature. This rain changed into an icy spray before reaching the ground. [Text] [Moscow TRUD in Russian 11 Mar 81 p 4] 7026

WEATHER AND CROPS--During January the wintering of the crops took place under conditions involving mainly warm weather and a large amount of precipitation, which fell mostly in the form of damp snow and rain. Since the beginning of this year, there had not been a firm snow cover in the western or central regions of the republic. In the extreme eastern regions there was a firm deposit of snow commencing with the very first days of January; its height reached 20-30 centimeters and in the region of Gayzin'kalna by 10 February -- 47 centimeters. The freezing depth remained low -- 10-20 centimeters and in a number of eastern regions of Latvia -- 30-70 centimeters. The upper layer of soil thawed out to a depth of 5-10 centimeters during warm periods. The minimal temperature of the soil at the tillering node depth for plants of wintering crops did not drop lower than 1-6 degrees and in a number of regions it was close to zero. Under the warm weather conditions, the winter crops consumed the nutrients accumulated during the autumn at an intensive rate and this brought about a deterioration in their condition. This was borne out by the results of winter crop samples taken from the fields in late August to early February, on 200 farms and at 20 hydrometeorological stations and from an area of approximately 23,500 hectares. Eighteen percent of the winter rye samples and 16 percent of the winter wheat revealed a raised thinness of plant stand and last year the crops wintered better. Lower temperatures are expected in the near future. [Text] [Riga SOVETSKAYA LATVIYA in Russian 15 Feb 81 p 3] 7026

FIELD WORK PREPARATIONS--Volgogradskaya Oblast--Spring in the lower Volga region continues to make its presence known. Fog and sunshine, frost and warmth, snow and

rain -- such are the conditions that the grain growers are living through during these March days. But there has been no abatement in the tense work being carried out in the workshops and seed grain storehouses. And at last the time arrived for a final check on the readiness of the farms for the spring field operations. "This year the Volgograd farmers vowed to obtain no less than 20 quintals of grain from each hectare" stated the deputy chief of the oblast agricultural administration, F.L. Kozlovskiy, "It is obvious that in order to achieve this goal it is not enough to merely prepare the equipment. Thus an extensive program has been developed in the oblast for raising the cropping power of the fields. It is already being implemented: a top dressing is being applied to the winter grain crops, which occupy more than 1.5 million hectares, using the ground method and also with the aid of agricultural aviation. Fields on which spring crops have been planted have also been fertilized. In the lower Volga region, decisive importance is attached to carrying out the spring sowing work as rapidly as possible. Having accelerated this work and assuming that it was carried out in a high quality manner, it is possible to obtain an increase of 4-5 quintals of grain per hectare. Towards this end, around-the-clock work is organized out in the field. The Volgograd workers have accomplished a great deal in behalf of the spring fields and yet there are those who, based upon old habits, postpone other important work until the last day. Some party committees of farms and rayon party committees, just as in the past, are tolerating the worthless practice of rush work. At a number of kolkhozes and sovkhoses in Pallasovskiy, Bykovskiy, Kletskiy and Surovikinskiy Rayons, not all of the equipment has been repaired. Serious defects are being detected in tractors and sowing machines sent up to the readiness line. Subsequently the machines must be returned once again to the workshops. There are large quantities of non-certified seed in Alekseyevskiy and Kotel'nikovskiy Rayons. Spring is at hand and the crops are imposing strict demands on all those working out on the fields and in the rear areas. [Excerpts] [Moscow SOVETSKAYA ROSSIYA in Russian 19 Mar 81 p 1] 7026

COTTON SOWING OPERATIONS--Spring has arrived in the Uzbek SSR. Red tulips have made their appearance and the almond, apricot and cherry trees are in bloom. The farmers are tending to their spring concerns. This is especially true in the southern part of Uzbekistan -- in the Surkhan Valley. The workers in Surkhandar'inskaya Oblast have commenced sowing their cotton. And this zone, as always, is the first to commence sowing the "silk cotton" -- the fine-fibred type. The Babatag tract, in the foothills of the Pamir Range, annually develops new hectares for the crops and this time new cotton areas have appeared on these tracts. The cotton growers in Kumkurganskiy, Dzharkurganskiy, Angorskiy and Termezskiy Rayons were some of the first to commence sowing seed for the "white gold." In carrying out the decisions handed down during the 26th CPSU Congress, the collectives of the farms in Kumkurganskiy Rayon resolved to carry out their cotton sowing work in a rapid and high quality manner. This year the rayon has vowed to obtain 45 quintals of the raw material from each hectare and to supply the state with approximately 55,000 tons of the "white gold." The sowing campaign has been organized in a fine manner on the fields of the 30 Let VLKSM and imeni Ul'yanov Sovkhoses, the Kyzyl Oktyabr' Kolkhoz and others. This year the workers in Surkhandar'inskaya Oblast plan to supply the state with 550,000 tons of cotton. [Text] [Moscow IZVESTIYA in Russian 20 Mar 81 p 1] 7026

ALFALFA AND CORN SOWINGS--Uzbek SSR--In accordance with the crop rotation plans, alfalfa during the first year of its use will be grown this year on approximately

200,000 hectares of irrigated land in Uzbekistan. This valuable forage crop and best predecessor crop for cotton is being sown in all zones of the republic with the exception of the northern rayons. The seed has already been placed in the soil on 80,000 hectares. More than one half of the areas have been sown with a cover of barley or wheat. The farms in Surkhandar'inskaya and Namanganskaya Oblasts were the first to complete their sowing work. Here the work was carried out almost 10 days earlier than last year. Simultaneously with the alfalfa, the farms in the southern rayons are commencing their sowing of corn for grain. The kolkhozes and sovkhoses in Dzharkurganskiy, Termezskiy, Kumkurganskiy and Sherabadskiy Rayons in Surkhandar'inskaya Oblast have joined in the competition to achieve a 100 quintal yield and they have set aside well fertilized and properly watered land for the corn. The seed for regionalized varieties which have proved their worth, including locally bred ones, is being planted in the soil. The farmers are marking the first year of the Eleventh Five-Year Plan with the introduction of the industrial technology for cultivating corn on an area of 200,000 hectares. On the whole, the sowings of this crop for grain are being increased by 50,000 hectares throughout the republic. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 12 Mar 81 p 1] 7026

WINTER GRAIN TOP DRESSINGS--Chimkent, 17 Mar--This year the oblast's winter grain crops endured the winter very well. Nevertheless the grain growers, taking advantage of the fine days, are applying a nitrogen fertilizer top dressing to them in all areas. Use is being made of both ground equipment and aircraft of agricultural aviation. Mineral fertilizer has already been applied to more than one half of the winter grain crops. The crews of V. Shpil'chuk and I. Pomovich are leading the competition for the "airborne farmers." Working out on the fields in Saryagachskiy Rayon, each has applied a top dressing to 11,000 hectares of crops. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Mar 81 p 1] 7026

SOWING OPERATIONS COMMENCE--Ordzhonikidze, 17 Mar--The farmers in the Severo-Osetinskaya ASSR commenced their sowing of spring crops today. They are planting first class seed for oats, peas and perennial grasses. High protein forage crops -- rape and soybeans -- are appearing for the very first time, on large areas, in the Terek River valleys. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Mar 81 p 1] 7026

SOIL CULTIVATION WORK--Simferopol'--The roar of tractor motors resound throughout the Crimean Steppe region. The machine operators have moved their soil cultivation units out onto the fields. [Text] [Moscow TRUD in Russian 20 Mar 81 p 1] 7026

SPRING GRAIN CROP SOWINGS--Przheval'sk-- The grain growers in Issyk-Kul'skaya Oblast -- the principal grain area in the Kirgiz SSR -- have commenced their sowing of spring grain crops. [Text] [Moscow TRUD in Russian 20 Mar 81 p 1] 7026

SPRING TOP DRESSING--The farms in the southern regions of Lithuania, where the snow has already disappeared from the fields, have commenced applying a spring top dressing to the winter crops. [Text] [Moscow TRUD in Russian 20 Mar 81 p 1] 7026

INCREASED GRAIN PRODUCTION--Ashkhabad, 20 Mar--The application of a top dressing to the winter grain crops in Turkmenistan has been completed. Water is being supplied to the fields a third time. As a result of proper tending of the crops, the mass tillering of the wheat has commenced and the barley on many tracts has already

entered the shooting stage. This year, as a result of improvements in the agricultural practices being employed, the plans call for 20 quintals of grain to be obtained from each of 85,000 hectares -- a greater yield than that obtained last year. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Mar 81 p 1] 7026

CORN SEED PROCESSING--Bryansk, 20 Mar--The pre-sowing processing of corn seed -- so-called hydrophobization -- has commenced throughout the oblast. This year, 80,000 hectares of arable land will be set aside for this crop -- 20,000 more hectares than last year. Its cultivation is being converted over to an industrial basis and a leading cultivation technology is being introduced. The corn will be grown on fertile land and the plants tended by mechanized teams. Hydrophobization makes it possible to complete the sowing work at an earlier date and to protect the seed against diseases and pests. The corn growers are presently completing their last preparations prior to moving out onto the fields. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Mar 81 p 1] 7026

COUNTRY'S HIGHEST FIELDS--Naryn, 20 Mar--Mechanized sowing complexes have moved out onto the country's highest fields -- in Narynskaya Oblast. During the years of the Tenth Five-Year Plan, the grain growers, in close collaboration with the machine operators and scientists, transformed the mountain plateaus of the Central Tyan'-Shan' Range into a large grain area in Central Asia. The oblast's irrigated fields exceed 100,000 hectares and today the grain crops are being grown on regularly irrigated land. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Mar 81 p 1] 7026

SUGAR BEET FIELDS EXPANDED--Vilnius, 20 Mar--The formation of 500 mechanized detachments for the cultivation of sugar beets has been completed at kolkhozes and sovkhozes in Lithuania. The farmers in Vilkavishskiy Rayon, where every other farm specializes in the cultivation of this crop, made very thorough preparations for the sowing campaign. The detachments include teams for preparing the soil for sowing, for carrying out transport operations and for maintaining the equipment. The rayon agrochemical service prepared recommendations for applying fertilizer and herbicides to the soil. This year the republic's beet fields will be expanded to 40,000 hectares. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Mar 81 p 1] 7026

FOUNDATION FOR INCREASED YIELDS--Rostov-na-Donu, 11 Mar--The Don River farmers, by way of responding to the decisions handed down during the 26th CPSU Congress, are launching a competition to make the spring period of the initial year of the five-year plan a spring of high agricultural practices. A firm foundation is being created for increasing the yields for all agricultural crops. The front of the initial stage of the spring work is widening out on the fields -- a top dressing is being applied to the winter crops and they are being protected against pests. The grain growers in Sal'skiy, Peschanokopskiy, Azovskiy, Neklinovskiy, Orlovskiy and Morozovskiy Rayons are taking full advantage of the fine weather. Chemical agents are being applied to the slightly frozen land with the aid of aircraft and when the upper soil layer so permits -- ground mineral fertilizer spreaders are being placed in operation. Overall, on farms throughout the oblast, mineral fertilizer has already been applied to 1 million hectares, or one half of the areas planned. The oblast's machine operators have equipped 3,600 units for applying surface top dressings. The plans call for this progressive agricultural method for raising the cropping power of the winter crops to be used on 900,000 hectares. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 12 Mar 81 p 1] 7026

KUBAN' SOWING OPERATIONS--Krasnodar, 11 Mar--The mass sowing of spring crops has commenced in the Kuban' region. Hundreds of sowing complexes are engaged in sowing barley, oats, peas and perennial grasses. Spring grain and pulse crops have already been sown on tens of thousands of hectares. Spring crops will be sown in Krasnodarskiy Kray on 2 million hectares of autumn plowed land. Of this amount, one third will be used for the cultivation of sugar beets, sunflowers, corn and soybeans using the industrial technology. Approximately 2,660 mechanized teams and detachments are displaying concern for the crops on the industrial fields. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 12 Mar 81 p 1] 7026

UNSTABLE MARCH WEATHER--Azerbaijan SSR--The weather during March was particularly unstable throughout the republic. The warm, spring-like sunny days which occurred during the winter months were replaced by cold days when a cyclone burst into the area. Snow even fell in the sub-tropical region of Lenkoran'. [Excerpt] [Moscow SEL'SKAYA ZHIZN' in Russian 12 Mar 81 p 1] 7026

GEORGIAN SUGAR BEET PLAN--Kaspi (Georgian SSR), 12 Mar--Sowing operations have commenced in the Kartalinskaya Valley -- the principal producer of sugar beets in Georgia. More than 100 mechanized teams -- more than twice the number for last year -- have moved out onto the fields. During the past 5 years, beet production in the republic has for the most part been converted over to an industrial basis. The farms are equipped with precision drills, multi-purpose, automatic, electronic thinners and highly productive cultivators. For the first year of the Eleventh Five-Year Plan, the Georgian beet growers have resolved to obtain no less than 400 quintals of the sweet roots per hectare and to sell 50,000 more tons of them to the state than they did last year. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 13 Mar 81 p 1] 7026

IMPORTANCE OF LOCAL FERTILIZER--Kursk, 14 Mar--In the campaign to achieve a high harvest for the first year of the Eleventh Five-Year Plan, the oblast's farmers are attaching great importance to the local fertilizers, which have not been used sufficiently in the past. By the end of the first 10 days in March, they had moved more than 3 million tons of farmyard manure out onto the fields -- 1 million more tons than were delivered by this same date last year. The greatest amounts of organic materials were obtained by the kolkhozes and sovkhoses in Shchigrovskiy Rayon. They are completing fulfillment of their task for 5 months. In Kastorenskiy, Konyshhevskiy and Timskiy Rayons, the 5 month plan has been completed by 75 percent. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Mar 81 p 1] 7026

KIRGHIZ SSR SPRING SOWINGS--The grain growers on southern farms in the Kirghiz SSR have commenced their mass sowing of spring crops. Mechanized complexes are being employed out on the fields [Text] [Moscow PRAYDA in Russian 16 Mar 81 p 1] 7026

KIRGHIZ SSR CRAIN PLAN--Various field operations are being carried out in many regions of Kirghiz -- selective moisture retention work, top dressings for and harrowing of winter grain crops, early spring moisture accumulation waterings and other field operations. In almost all areas the equipment has been prepared in a fine manner, the machine operators have been selected and the work technology has been thought out taking into account the peculiarities of spring and of each field. This year the republic's farmers plan to produce 1.45 million tons of grain. A large portion of this volume will be produced in the Chu River valley, which quite

properly is referred to as a grain area. The farms in this valley carried out extensive field work, including the sowing of grain and perennial grass crops. This work is being carried out in a highly organized manner on fields in the southern zone. The machine operators in Sokulukskiy Rayon, once the dry and sunny weather set in, commenced operating their units using the group method. [Excerpt] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Mar 81 p 1] 7026

ORGANIC FERTILIZER DELIVERIES--Rostov-na-Donu, 12 Mar--"Every spring hour -- concern for the crops" -- such is the motto of machine operators assigned to fertility detachments of the Tatsinskii raysel'khozkhimiya. They are carrying out the schedule ahead of time and supplying the fields with 800-900 or more tons of local organic fertilizer daily. The machine operators of the Aksay raysel'khozkhimiya -- the initiators of an oblast socialist competition -- carried out their task of delivering organic fertilizers ahead of schedule. Since the beginning of this current year, the fertility detachments of kolkhozes, sovkhoses and sel'khozkhimiya associations have already applied 5.4 million tons of organic materials to the fields. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 13 Mar 81 p 1] 7026

ODESSKAYA OBLAST SOWING OPERATIONS--Odessa, 16 Mar--This year the machine operators in the Black Sea area waited a long time for spring to arrive; their soil cultivation units were moved out onto the fields as early as February. The return of cold weather delayed the mass sowing of crops. However, the warm winds and sunshine being experienced at the present time are rapidly warming the soil and thus the farmers are now busily at work. Wide-cut units are being employed in almost all areas throughout the oblast and all of the sowing equipment is being operated using the group method. This is making it possible to reduce the sowing schedules considerably and at the same time it is guaranteeing high yields. The front of the field work is rapidly advancing to the north from the Danube and the Black Sea. [Excerpts] [Moscow SEL'SKAYA ZHIZN' in Russian 17 Mar 81 p 1] 7026

STAVROPOL'SKIY KRAY FIELD WORK--The farms in Stavropol'skiy Kray have joined in the spring field work. The machine operators, taking advantage of the leading experience of the Ipatovo farmers, are striving to achieve high indicators in carrying out their sowing operations. More and more farms and rayons throughout the kray have joined in the spring field work. Just as in the past, the spring crops are being sown based upon the Ipatovo experience and only first class seed is being employed. Commencing with the very first days, the machine operators have been working at a high tempo. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 15 Mar 81 p 1] 7026

SELECTIVE SOWINGS--The machine operators in Stavropol'skiy Kray have commenced the selective sowing of early grain crops. The kray's farms have vowed to carry out this work during the best agrotechnical periods. [Text] [Moscow PRAVDA in Russian 16 Mar 81 p 1] 7026

WINTER CROP TOP DRESSING--Kiev, 19 Mar--Nitrogen fertilizer top dressings are being applied on a mass basis to the winter crops on farms in all oblasts of the republic. This important agricultural method has already been carried out on several million hectares. There are approximately 500 special complexes in operation out on the fields and they have at their disposal hard surface sites and the loading and unloading equipment required for the "winged grain growers." A surface top dressing is being applied to winter crops on considerable areas using ground equipment. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 20 Mar 81 p 1] 7026

SPRING WORK UNFOLDS--Stavropol'--The Ipatovo farmers are greeting the arrival of spring, for the first year of the Eleventh Five-Year Plan, by performing their tasks rapidly and in a high quality manner. Field work has unfolded on many of the farms. The selective sowing of spring crops has commenced. [Text] [Moscow TRUD in Russian 20 Mar 81 p 1] 7026

RAISED OBLIGATIONS--Makhachkala, 12 Feb--The farmers in the Dagestanskaya ASSR vowed to deliver 1 million tons of organic fertilizer to the fields during the winter. And they are holding to their promise. In January alone, 718,000 tons of farmyard manure and compost were delivered to the future fields. Having acquainted themselves with the decree of the CC CPSU and the USSR Council of Ministers entitled "Additional Measures For Preparing For and Carrying Out Spring Field Work During 1981," the collectives of kolkhozes and sovkhoses in this autonomous republic have reviewed their earlier obligations. The decision has now been made to deliver and apply to the soil 1.35 million tons of organic fertilizer. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 13 Feb 81 p 1] 7026

EQUIPMENT IN READINESS--In Odesskaya Oblast, all of the tractors and soil cultivation and sowing equipment have been prepared for the spring sowing campaign. Six hundred mechanized complexes and detachments have been created and organized in accordance with the Ipatovo method throughout the oblast. The oblast's farmers expect to complete their work of sowing early spring and pulse crops on more than 100,000 hectares in just 36 working hours. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Mar 81 p 1] 7026

SPRING FIELD WORK PREPARATIONS--Frunze, 17 Feb--The sowing of grain crops began today in the southern valleys of Kirghizia. The grain growers in Lyaylyakskiy Rayon, Oshskaya Oblast were the first to move their sowing units out onto the fields. The republic's farmers have completed their equipment repair work, their preparation of seed and they are forming up their sowing complexes. These complexes must sow spring crops on more than 260,000 hectares of fields. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Feb 81 p 1] 7026

WINTER THUNDERSTORM OVER VILNIUS--The residents of Vilnius were surprised this year by the mild winter, especially during February. Periods of hawing weather followed one after another. On one occasion a bright flash suddenly lit up the evening sky over the city. It was followed by resounding claps of thunder. Thereafter the rain came down in torrents. This February thunderstorm was caused by a cyclone, the southern wing of which touched Vilnius. It was at this time that a large temperature difference developed. On the earth's surface there were 1-2 degrees of heat and at a height of 3 kilometers -- 18 degrees of cold. The thunderstorm was caused by this temperature differential. Such a phenomenon, considered to be unusual for the winter period, occurs roughly only once every 10 years according to the meteorologists. [Text] [Moscow TRUD in Russian 23 Feb 81 p 4] 7026

UNUSUAL WEATHER CONDITIONS--Nal'chik--For a half century at least, residents of the Kabardino-Balkarskaya ASSR have not observed such natural anomalies in February. Willow, alder and nut trees broke out of their winter hibernation much earlier than usual. On sunny days the air was filled with the aroma of blossoming catkin and the droning of bees. These natural surprises began towards the end of last year. The Indian summer came very late: it was not until December that the silver threads of a spider web began sparkling in the sky. Light snow fell on only two occasions in January and it melted away immediately thereafter under the sun's rays. Common snowdrops sprang to life in the foothills and violets began blooming in a forest-park in Nal'chik. [Text] [Moscow TRUD in Russian 22 Feb 81 p 4] 7026

FIRST CLASS SEED--Nikolayev, 16 Feb--The February "windows" served as a type of test for the farmers. Several warm days -- and units with harrows and cultivators were moved out onto the fields and in some areas even sowing machines. An initial inspection revealed that the farms were prepared for the most part for work out on the fields. Almost 96 percent of the seed prepared for spring sowing throughout the oblast was of first class quality. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 19 Feb 81 p 1] 7026

SOWING OPERATIONS COMMENCE--Simferopol', 17 Feb--In the Crimea, February often serves as a check on the readiness of the farmers for their field work. Thus, this year, during the first 10 days of the month, a period of warm weather set in and the soil dried out. The machine operators in Bakhchisarayskiy, Simferopol'skiy, Sakskiy and other rayons quickly joined in the work. Immediately following the harrows, the Kolkhoz imeni XXI S'yezda KPSS in Dzhankoyevskiy Rayon moved its units with cultivators and sowing machines out onto the fields. Sowing operations have commenced at the Avangard and Saki Sovkhozses and on other farms. The front of the field work is advancing from the south into the northern part of the peninsula. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 18 Feb 81 p 1] 7026

UNUSUAL WINTER WEATHER--Yalta--On the eve of spring, at a time when the vegetation was already beginning to blossom and turn green in Yalta, a snowstorm struck the area. Sanatoriums, holiday hotels, tourist bases and other buildings were all covered by a layer of snow. Everything appeared different in the morning. It was as though a winter fairytale was being played out in the tourist capital of the sunny peninsula. Over a period of more than 100 years of regular weather observations, the Yalta weather specialists had never encountered such different surprises as have been presented by this year's winter. For example, in 1948 the first abundant snowfall was recorded in November. At that time the land was covered by a 10 centimeter layer of snow. This year the residents of Yalta encountered winter in the middle of February. It was caused by a cyclone, which resulted in a snowstorm striking the southern coastline. [Text] [Moscow TRUD in Russian 21 Feb 81 p 4] 7026

UZBEKISTAN CROP YIELDS--Tashkent--Yesterday the farms in the southern oblasts of Uzbekistan commenced their combined sowing of beets and corn. Such sowings will be carried out this year on 200,000 hectares throughout the republic -- five times more than last year. They are making it possible to realize a high return from the use of irrigated land. The plans for the leading farms call for 200 quintals of root crops, 100 quintals of grain and a large quantity of fodder to be obtained from each hectare of field. [Text] [Moscow TRUD in Russian 6 Mar 81 p 1] 7026

PEAT FOR IMPROVED FERTILITY--Smolensk, 4 Mar--Each day, dozens of fertility detachments are moving organic fertilizers out onto the fields. This work is being carried out successfully in Monastyrshchinskiy Rayon. The rayon has been supplied with more than 250,000 tons of compost in behalf of this year's harvest -- considerably more than called for in the schedule. Peat constitutes a large proportion of the compost. Up to 2,000 tons of it are being shipped daily to kolkhozes and sovkhozes from the Turkovskiy enterprise. The peat is delivered to the farms and mixed with farmyard manure out on the fields. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 5 Mar 61 p 1] 7026

ORGANIC FERTILIZER APPLICATIONS--Smolensk--By employing the Ipatovo method for transporting organic fertilizer, the oblast's kolkhozes and sovkhozes made up the time lost during the autumn period of bad roads. More than 400 specialized detachments and teams for providing technical services were created. They have approximately 3,000 tractors and motor vehicles at their disposal. Each day the machine operators are transporting 60,000-80,000 tons of organic fertilizer. More than 5 million tons of fertilizer have already been applied to the fields since the beginning of winter. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 6 Mar 61 p 1] 7026

EARLY SOYBEAN SOWINGS--Abasha, 5 Mar--The warm spring weather has accelerated the course of field work in Georgia. The farms in western Georgia commenced their soybean sowing work 2 weeks earlier than usual. Almost 17,000 hectares of fields have been allocated for this crop this year. The Georgian plant breeders have bred eight promising varieties of soybeans -- each for a definite zone. In the west, under subtropic conditions, Kolanda-4 has been regionalized. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 6 Mar 61 p 1] 7026

INCREASED SOYBEAN ACREAGE--Abasha (Georgian SSR)--Yesterday, 2 weeks earlier than usual, the farms in western Georgia commenced sowing their soybeans. This year, this valuable crop is to be grown on 19,000 hectares throughout the republic -- two times more than the figure for 5 years ago. By the end of the new five-year plan, as called for in connection with development of the feed base for Georgia, the soybean area is to be increased by still another 8,000 hectares. [Text] [Moscow GUDOK in Russian 6 Mar 61 p 1] 7026

SPRING FIELD WORK COMMENCES--Dushanbe, 4 Mar--The farmers in the Gissarskaya Valley are commencing their spring field work in an organized manner. On farms in Leninskiy, Tursunzadevskiy, Gissarskiy and Ordzhonikidzeabadskiy rayons the plowing has been completed, more local and mineral fertilizers have been procured than was the case last year and the equipment is being employed in a highly productive manner. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 5 Mar 61 p 1] 7026

EARLY SPRING SOWING--Dushanbe, 17 Feb--Taking advantage of the fine weather, the farmers in Kurgan-Tyubinskaya, Leninabadskaya and Kulyabskaya Oblasts and also in the Gissarskaya Valley commenced sowing their grain crops, grasses and leguminous grass mixtures considerably earlier than last year. Hundreds of sowing units are sowing alfalfa, barley and early vegetables. The farms in Shaartuzskiy, Kumsangirskiy, Yavanskiy, Voseyskiy and other rayons are planting their seed in well prepared soil. Work is being carried out on the cotton fields in connection with the capital and current leveling of the check plots and the cleaning of the

irrigation and land reclamation network. The sowing equipment is being repaired at a higher tempo. Seed has been delivered to a majority of the farms. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 16 Feb 81 p 1] 7026

SEED FOR SPRING SOWING--Novosibirsk, 16 Feb--Snowstorms are still raging over the Siberian fields, while the farmers are beginning to think about their spring problems. Their principal concern is the seed for spring sowing. Many kolkhozes and sovkhoses have completed the preparation of their grain crop seed. For the oblast as a whole, 430,000 tons have been sorted and of this amount 300,000 tons meet the requirements for 1st and 2d class of the sowing standard. The grain for sowing was prepared on farms in Dovolenskiy Rayon, where one half of the seed is of 1st class quality. The kolkhozes and sovkhoses in Ordynskiy, Moskovskiy and Bolotinskiy Rayons have completed cleaning their seed stock. The largest quantities of 1st and 2d class seed were prepared by the farmers in Novosibirskiy Rayon -- 96 percent and Cherapanovskiy Rayon -- 88.4 percent. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 17 Feb 81 p 1] 7026

AZERBAIJAN SOWING OPERATIONS--Neftechala--Alfalfa has been sown in the Muganskaya Steppe region. The farmers required 1 week in order to complete this work. Success was achieved owing to the timely preparation of the fields and the organization of the work of the sowing units in two shifts. The weather was also favorable: according to the meteorologists, this February was the warmest one in 30 years. The farms in the Kura-Araksinskaya Lowland and in the piedmont zones of Azerbaijan are sowing their perennial and annual grasses at a high tempo and exceeding their tasks. Seed for alfalfa, sainfoin, oats and soybeans has been planted on an area of more than 20,000 hectares. This is three times more than was sown by this same date last year. High prote'n forage crops -- rape and perko -- are appearing on large areas throughout the republic for the very first time. Almost one fifth of all of the fields will be used for mixed sowings of oats with vetch and corn with soybeans. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 6 Mar 81 p 1] 7026

SNOW RETENTION WORK CONTINUES--Barnaul, 18 Feb--Thousands of units are daily being moved out onto the fields in the Altay region for the purpose of carrying out snow retention work. This work is now being carried out on the third million hectares. Many farms in the Kulundinskaya Steppe and in Kamenskiy, Aleyskiy and other rayons have moved their units out onto the fields for conducting the snow retention work a second time. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 19 Feb 81 p 1] 7026

EARLY POTATO PLANTINGS--Yerevan, 20 Feb--The equipment has been moved out onto the fields in Armenia -- the planting of early potatoes is commencing today in the Ararat Valley. The machine operators in Maslaskiy and Araratskiy Rayon were the first to commence this work, having launched a socialist competition for achieving a high yield -- 200 quintals of tubers from each hectare. This year the republic's farmers have vowed to obtain more than 20,000 tons of early potatoes. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Feb 81 p 1] 7026

SUGAR BEET PLANS--Kursk, 20 Feb--This year the oblast's kolkhozes and sovkhoses will grow sugar beets and corn on large areas using an industrial technology. At the present time, the technical equipment and seed are being prepared and mass training is being provided for the personnel. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Feb 81 p 1] 7026

HIGH SOYBEAN YIELD--Khabarovsk, 20 Feb--Last year the farmers at the support-demonstration farm of the Birobidzhan Experimental Station obtained a high yield of soybeans. They over-fulfilled their plan for selling high quality seed to the sovkhoses and they won the kray competition for soybean growers. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 21 Feb 81 p 1] 7026

COMBATING RODENTS--Chelyabinskaya Oblast--The beginning of this present winter served as a reminder to many Ural horticulturists of the winter of 1977. It did not arrive suddenly: a little snow would fall and then it would melt and thereafter the land became paralyzed by frost and covered with an icy coat of armor. It was difficult for the rodents to find food and thus they moved from the fields into the orchards. Many fruit trees and bushes perished during that winter. This year is somewhat similar to 1977. Thus special care must be taken in order to protect the plantings against the rodents. Rags, scraps of thick felt saturated with nitraphen (many horticulturists are using creolin successfully for scaring away mice) and also gauze bags filled with naphthalene constantly hang from the branches and trunks of apple trees in my orchard. The aroma of naphthalene persists for a long period of time and is very effective for frightening away hares. I also spread ash, urea and superphosphate in a circle about the tree trunks. These are also avoided by the rodents. I would like to furnish the amateur horticulturists with a piece of advice for the future: never leave heads of cabbage, beet haulm, root crops or piles of branches from fruit and berry trees or shrubs lying around out on the tracts, since they attract rodents into the orchards. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 11 Feb 81 p 4] 7026

ALMA-ATINSKAYA OBLAST GRAIN PLAN--The farmers in Alma-Atinskaya Oblast have joined in the campaign to obtain a good harvest for the first year of the five-year plan. They have commenced sowing their early grain crops. The seed for highly productive drought resistant barley varieties is being placed in the soil simultaneously with an application of mineral fertilizer. In the semi-desert zone, where large tracts were developed last year, the grain crops are being sown in wide strips alternately with grasses. The machine operators are reducing to a maximum degree the pause which takes place between the pre-sowing tilling of the soil and sowing -- multiple-purpose units are being employed out on the fields. This year the oblast's farmers have vowed to sell 250,000 tons of grain to the state -- considerably more than the figure called for in the plan. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Mar 81 p 1] 7026

SOWING OF CORN--The sowing of corn has commenced in the Murgab Valley and in the Kara-Kum virgin land in the Turkmen SSR. This crop will be grown together with beets on large fields, thus ensuring a twofold yield from each hectare of plantation. Corn will be planted on 14,000 hectares in Maryyskaya Oblast -- a considerably larger area than last year. The plans call for one half of the fields to be cultivated using the industrial technology. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Mar 81 p 1] 7026

EARLY POTATO PLANTINGS--The farms in the piedmont zone of the Severo-Osetinskaya ASSR commenced the planting of early-ripening varieties of potatoes 2 weeks earlier than usual. The areas being used for this crop are being expanded here. This year the decision was made to raise potato production to 65,000 tons. Potato production has become a leading branch of crop husbandry in the republic. Last year the farms

obtained an average of 250 quintals or more of tubers per hectare. This year they plan to obtain 300 quintals from each hectare. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Mar 81 p 1] 7026

VEGETABLE SEED SHORTAGE--Our editorial offices receive letters complaining of the difficulty of buying fodder beet, edible beet, and carrot seeds in vegetable seed stores. S. Budrius, head of the republic association "Sėkla" (Seed) explained that unfavorable weather conditions are responsible for less edible beet, fodder beet and carrot seed being produced. That is why stores sell them in smaller quantities. Farms, rayon agricultural administrations should help farmers obtain the necessary quantities of seed and organize their distribution to the farmers. Also, in many places we have already grown accustomed to planting fodder and edible beets by a blanket sowing rather than by single seedling and later thinning out the thick plantings. Lacking seeds, we should grow the seedlings ourselves and plant them in the prepared soil later. [Text] [Vilnius VALSTIECIU LAIKRAŠTIS in Lithuanian 31 Mar 81 p 2]

FORAGE CROP HARVEST--The farms in the Vakhsh Valley in Tadzhikistan have commenced the mass cutting of forage crops on an area of 30,000 hectares. Leguminous grass mixtures, rape and perko were sown in the autumn on plantations upon which cotton was previously grown. The farms, kolkhozes and sovkhozes will obtain 500,000 tons of fresh feed. The harvesting of the first crop is being carried out at a high tempo in order to ensure the timely preparation of the fields for cotton. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 Mar 81 p 1] 7026

CSO: 1824/146

LIVESTOCK FEED PROCUREMENT

REQUIREMENT FOR INCREASING FEED CROP YIELD IN RSFSR STRESSED

Moscow SEL'SKAYA ZHIZN' in Russian 18 Mar 81 p 2

[Article by V. Dorofeyev, professor and corresponding member of VASKhNIL; A. Ivanov, doctor of agricultural sciences and head of the Department of Forage Crops at the All-Union Scientific Research Institute of Plant Growing, Leningrad: "Productivity of a Fodder Field"]

[Text] One vital problem in agriculture is that of increasing the production of coarse and succulent feed. In many regions of the non-chernozem zone, a shortage of such feed is compensated for through the use of expensive mixed feeds and this results in higher costs for the products of animal husbandry. This situation can be corrected. But how? By increasing sharply the production of forage crops. In order to do this, the acute and chronic shortage of seed for many of these crops must be overcome and their assortment expanded substantially.

On farms in the non-chernozem zone, for example, there are very few plantings of alfalfa, alsike and white clover, sweetclover, reed fescue, canary grass, grazing rye grass, winter rape, field kale or a number of other valuable forage crops. Areas set aside for some of the more highly productive and fertilizer-responsive perennial grasses, such as awnless brome grass and meadow fescue, are being expanded very slowly.

The livestock breeders are well aware of the importance of keeping their animals supplied with full value green feed, which actively promotes weight increases in the animals, raised milk yields, improved fertility and makes it possible to sharply curtail expensive concentrates in the rations. Certainly, it is not easy to achieve this and yet it is possible.

At the All-Union Institute of Crop Husbandry, we are developing this problem in two directions. First -- a study of the gene fund and the breeding of forage crops for the purpose of raising their productivity and nutritional value and the capability to form feed bulk at various times; second -- the introduction of valuable varieties, hybrids and populations from abroad, their testing and the advancement of the better ones into production operations. This work is being carried out in contact with many plant breeding institutes of the non-chernozem zone of the RSFSR.

All of this is promoting an expansion of the assortment of forage crops possessing growing seasons of varying lengths: new forage plants are being introduced into the

culture which are distinguished by high productivity, nutritional feed bulk, intensive growth, resistance against pests and diseases and responsiveness to a high culture of farming, including irrigation and the application of raised dosages of fertilizer. Thus, based upon a recommendation by an institute in Leningrad Oblast, reed fescue was introduced into the culture only recently; under irrigation conditions, it is capable of furnishing up to 900 quintals of fodder per hectare from three cuttings. One variety of it is already being cultivated extensively in production. The institute supplied the seed production farms with 732 quintals of reed fescue seed.

Work is being expanded with regard to such promising forage crops for the non-chernozem zone as clover, reedgrass, eastern milk vetch, common sloughgrass and oil-bearing radish. New silage crops are being studied -- cowparsnip, alfalfa, confrey, mallow, jointweed, Jerusalem artichoke, rape, wild cabbage and others. Next in line is the development of such a valuable forage crop as amaranth, which upon the recommendation of the institute is undergoing testing on irrigated land at Khakasii in Krasnoyarskiy Kray, where it is furnishing up to 1,000 quintals of highly nutritious and rich protein bulk per hectare. The feed being procured at the present time, particularly that in the non-chernozem zone, is extremely low in plant protein -- it amounts to roughly 25 percent. This protein deficit is particularly critical during the indoor maintenance period and thus it leads to a considerable over-expenditure of feed and to a reduction in the productivity of the animals. At VIR [All-Union Scientific Research Institute of Plant Growing] the protein problem is being solved through the efforts of many departments and branches. Thus the new and promising (for the northwest region) Oktyabr' alsike clover variety was bred at the Pavlovsk Experimental Station. It is already undergoing testing at state strain testing stations in Leningrad Oblast and it has displayed a high winter hardiness and good seed productivity. A promising variety of white clover -- Belgorskiy -- was also developed at the Northwestern Scientific Research Institute of Agriculture.

The experience of many leading farms indicates that it is very profitable to cultivate alfalfa in many regions of the non-chernozem zone. Possessing good longevity, winter hardiness, responsiveness to irrigation and high feed qualities, it serves as a fine supplement to alsike clover and on soddy-calcareous soils it must become a leading pulse forage crop. When good agricultural practices are employed, it will produce a fodder yield here of 350-450 quintals per hectare and under irrigation -- 500-600 quintals, that is, considerably more than alsike clover.

Studies have shown that the best fodder results are obtained in the non-chernozem zone of the RSFSR when domestic varieties of alfalfa are employed -- Severnaya Gibrinaya, Omskaya-8893, Marusinskaya-81, Poltavskaya-256, Flora, Urzhumskaya Mestnaya and others. But the seed for this crop can be obtained here only if a special agrotechnical complex of operations is observed.

The quality of the feed, its protein content and overall nutritional value are obviously dependent not only upon the presence in the fodder, hay, silage, haylage and grass meal of a pulse component, but also upon the quality of the principal grass and the technology employed for procuring, preserving and protecting it. As a result of crude violations in this work, the feed losses in the non-chernozem zone of the RSFSR reach as high as 25-30 percent and on individual farms -- 50 percent.

The most widespread violation of the feed procurement technology is that of tardiness in the cutting down of the grasses. We are reminded that the nutritional value of 1 kilogram of dry substance, for example alsike clover, harvested at the commencement of budding, is 0.93 feed units and during the blossoming phase -- only 0.72. In the first instance, 73.5 quintals of feed units are obtained per hectare and in the second -- 58.5. The same can be said regarding cereal grasses.

An analysis of feed procurement operations in Moscow and Leningrad Oblasts reveals that four fifths of the sown perennial grasses are harvested here on a very tardy basis (up to 30 days) and, as a result, the farms suffer shortfalls of approximately 250,000 tons of feed units and more than 30,000 tons of digestible protein. What causes such unacceptable delays? They are caused not only by a shortage of the necessary equipment, but mainly by unsatisfactory organization of the work.

In order to increase the feed yield per unit of space, great importance is attached to including intermediate crops in the green conveyer line, crops which will make it possible, under the conditions found in the non-chernozem zone, to obtain two harvests of feed bulk annually. Use can be made for this purpose of annual grasses, corn, field kale, rutabagas, turnips, potatoes, rape, mustard, oil-bearing radishes and wild cabbage. The intermediate crops, with no additional areas being made available for the forage crops, make it possible not only to increase their yields substantially but in addition they ensure to a better degree that the livestock will be supplied with green feed during the early spring and late spring periods, at which times the pasture vegetation is insufficient and it is more efficient to load the raw materials onto machines for processing into grass meal and protein concentrates.

An intensification of feed production is directly dependent upon raising the cropping power and gross yields of the grain and grain forage crops. During the past few years, varieties of these crops have appeared which are making it possible to do this in all areas.

Food roots are deserving of considerably greater attention. They constitute highly nutritious and succulent feed and a type of feed that is required by the animals. They are all intensive type crops. When a high level of agricultural practices is employed, they furnish high yields per hectare: rutabagas and turnips at sovkhoses in Leningrad Oblast -- an average of 350-450 quintals.

Post-harvest plantings of turnips furnish considerable amounts of fine feed bulk. They can serve as an important source for succulent feed. The Esti Nazris variety of turnips, when sown on 25 June at the Pavlovsk Experimental Station of VIR produced 610 quintals of root crops per hectare and 200 quintals of haulm and when sown on 10 July -- 396 and 150 quintals respectively. The leaves of turnips are rich in protein, vitamins, salts and calcium and they constitute up to 40 percent of the overall biological yield. In the case of rutabagas and turnips and for a root crop yield of 500-600 quintals, the harvest of leaves reaches 150-300 quintals per hectare. Their use is very profitable and convenient: the harvesting work can be fully mechanized. Such high productivity varieties of rutabagas as Vyshegorodskaya Uluchshennaya, Vil'gel'burgskaya, Vays, Reva and others should be reproduced on an extensive scale.

The common varieties of fodder beets -- Ekkendorfskaya Zheltaya and Barres -- contain insufficient dry substances and sugars in their root crops and they are not very suitable for machine harvesting. Thus, special attention should be given to the semi-sugar beet varieties, particularly the Dutch Favorit and Evrika varieties, obtained from the VIR collection. Over a period of a number of years in Leningrad and Moscow Oblasts, they surpassed the standard in terms of dry substance yield per unit of space by 15-20 percent. They possess one important advantage -- more uniform placement of the root crops in the soil and suitability for two-stage harvesting of the haulm and root crops using a KIR-1.5 unit or re-equipped potato diggers.

The intensification in feed production operations, as borne out by experiments and practical experience, is promoting the use of a scientifically sound system of fertilization and irrigation. In particular, the following regularity has been established: when raised dosages of nitrogen are applied, the protein content in the fodder of many grasses (awnless brome grass, meadow fescue and rye grass) increases considerably and it becomes more nutritious. Full advantage must be taken of this factor.

In the decisions handed down during the 26th party congress, the plans call for new and higher rates of development for feed production. They require good scientific support. And the Scientists at VIR have actively joined in carrying out this honorable task.

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LIVESTOCK FEED PROCUREMENT

REQUIREMENT FOR INCREASING PRODUCTION OF MIXED FEED STRESSED

Moscow MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PROMYSHLENNOST' in Russian No 1, Jan 81 pp 7-8

[Article: "In the USSR Ministry of Procurement"]

[Text] A very important period is at hand for the country's animal husbandry branch, that of ensuring the successful wintering of the livestock during the 1980/1981 season. The mixed feed industry has been assigned an important role in the carrying out of this task. In this regard, the problems concerned with ensuring the production of the required quantity of mixed feed and improvements in its quality were discussed during a meeting of the Board of the USSR Ministry of Procurement, held towards the end of last year.

The Board noted that the workers of the food industry of the USSR Ministry of Procurement, in carrying out the decisions handed down during the 25th CPSU Congress and the July (1978) and October (1980) Plenums of the CC CPSU, are undertaking all measures required for increasing the production of high quality products. During the Tenth Five-Year Plan, the mixed feed production plans were successfully fulfilled by the Minzag's [Ministry of Procurement] of all of the union republics. The five-year plan for the production of mixed feed was fulfilled or over-fulfilled ahead of schedule, prior to 1 November 1980, by the Minzag's for the Belorussian SSR -- by 101.4 percent, Uzbek SSR -- 100.5 percent, Georgian SSR -- 101 percent, Azerbaijan SSR -- 102.3 percent and Latvian SSR -- by 101 percent; for the production of BVD [belkovo-vitaminnyaya dobavka; protein-vitamin additive] by the Minzag's of the Kirgiz SSR -- by 103 percent, Armenian SSR -- 107 percent; for the production of mixed feed for poultry by the Minzag's of the RSFSR -- by 102.5 percent, Ukrainian SSR -- 100.6 percent, Azerbaijan SSR -- 100 percent, Moldavian SSR -- 104 percent, Latvian SSR -- 102.7 percent, Turkmen SSR -- 104.4 percent and the Estonian SSR -- by 102 percent.

However, the animal husbandry requirements for mixed feed are not being satisfied fully and they are constantly increasing. In this regard, incidents involving non-fulfillment of the production plans for BVD, granulated mixed feed, premixes and carbamide concentrate cannot be tolerated and yet such incidents are still taking place. Thus, during the Tenth Five-Year Plan the production plans for BVD were not fulfilled by the Minzag's of the RSFSR, the Uzbek SSR and the Azerbaijan SSR; for the production of granulated mixed feeds -- by the Minzag's of the RSFSR, the Uzbek SSR, Kazakh SSR, Azerbaijan SSR, Armenian SSR and the Estonian SSR. Nor did the mentioned ministries fulfill their plans in terms of these indicators during 1980.

Only the Minzag's for the Lithuanian SSR, Moldavian SSR and Tadzhik SSR fulfilled their plans for the production of carbamide concentrate. The cited indicators testify to the fact that the procurement ministries of the union republics are exercising only weak control over the work of the enterprises and over the use by them of their raw materials, material and labor resources.

Nor is all going entirely well with regard to the quality of the products being produced by the mixed feed industry. There are still enterprises where the production technology is not being followed, where the production-technical laboratories are exercising only weak control over the introduction of the technological process and where incidents of incorrect use of raw material resources are taking place.

Proper work is not being carried out in the procurement ministries of the union republics, the grain products administrations or in the mixed feed enterprises themselves, with regard to the issuing of funds for raw materials and, conversely, the wilful release of individual types of raw materials to kolkhozes, sovkhoses and other organizations is being tolerated. Such an attitude towards the state raw material resources represents a crude violation of fund discipline and it results in a lowering of the quality of the products being produced, it disrupts the established assortment for the mixed feeds and it causes an over-expenditure of grain from the state resources and the halting of enterprise operations owing to an absence of raw materials.

In order to ensure that animal husbandry is supplied with mixed feeds on a continuous basis and in the established assortment, the Minzag's of the union republics must undertake measures aimed at ensuring the timely and complete issuing of funds for all types of raw materials, the correct disposition of the raw material resources at the mixed feed enterprises and their proper utilization. In addition, special attention must be given to those types of raw materials which are in short supply, so as to ensure the priority fulfillment of the production plans for mixed feeds for poultry, state animal husbandry complexes, young agricultural livestock and for fish.

Under conditions involving a shortage of protein types of raw materials, importance is attached to intensifying the work of collectives of enterprises and animal husbandry farms, in connection with increasing the production of carbamide concentrate, mixed feeds and RVD and using these types of products for feeding to large-horned cattle. This will make it possible to release a considerable portion of the protein for the production of other valuable types of mixed feeds.

New types of raw materials, for example tapioca, are now being used for the purpose of augmenting the raw material resources used in the production of mixed feeds. Tapioca can be added to mixed feed in an amount not to exceed 20 percent, for use in the raising and fattening of young large-horned cattle stock (more than 6 months of age), young replacement hogs (4-8 months), suckling pigs (from 2 to 4 months, hogs for fattening (with the exception of controlled fattening), for milking cows and in the amount of 10 percent for adult poultry and young poultry stock (more than 30 days of age). Tapioca is a product which is readily assimilated by an animal organism. It comes in a weak granulation (30 percent granules and 70 percent meal) and it replaces the grain in mixed feeds. Tapioca consists of no less than 60 percent starch, no more than 7 percent cellulose and 4 percent of a mineral mixture.



Key:

1. Growth in the production of mixed feed
2. 1985 (plan)

In the near future, the mixed feed enterprises will also begin receiving a granulated feed mixture consisting of barley -- 66 percent, soybean oil-seed meal -- 26.6, molasses -- 3, mineral and stabilizing agents and vitamins -- 4.4 percent. This mixture will contain crude protein -- 18.0 percent, crude cellulose -- 5.3, calcium -- 1.3, phosphate -- 0.6, sodium -- 0.28, lysine -- 1.01, methionine and cystine -- 0.55 percent, Vitamin A -- 12,000 international units and Vitamin D₃ -- 1,500 international units. The feed mixture is recommended for use mainly in the mixed feed for all types of poultry and young agricultural livestock, with the actual content of protein, phosphate, calcium, cellulose and common salt in the mixture being determined. The mixed feeds, in terms of the quality indicators, must conform to the requirements of the standards.

An important factor with regard to achieving a considerable increase in the production volumes for high quality mixed feeds, BVD and premixes is that of ensuring the timely placing in operation of installations and capabilities of the mixed feed industry, as called for in the plans, as a result of new construction or through modernization and technical re-equipping work. Unfortunately, this work is beset by serious shortcomings. Construction installation work is being carried out in an extremely unsatisfactory manner at underway projects of Minzag for the Ukrainian SSR (Bratinovka in Dnepropetrovskaya Oblast), the Kazakh SSR (Shcherbakty in Pavlodarskaya Oblast). The mixed feed plants of Minzag for the RSFSR at Pavlovo in Gor'kovskaya Oblast and at Sukhinichi in Kaluzhskaya Oblast were placed in operation with a number of shortcomings. The schedules for placing capabilities in operation by means of modernization were disrupted owing to the untimely carrying out of preparatory work at enterprises in Vologda (RSFSR), Rechitsa in Gomel'skaya Oblast (Belorussian SSR) and others.

Considerable shortcomings also exist in connection with the mastering of planned capabilities. The production capabilities of mixed feed enterprises at Verkhov'ye

in Orlovskaya Oblast and at Barabinsk in Novosibirskaya Oblast were not mastered within the established normative periods. A plant at Roven'ki in Voroshilovgradskaya Oblast in the Ukrainian SSR has fallen behind in the norm for mastering its capability.



Key:

1. Growth in the production of protein-vitamin additives
2. Twofold increase, 1965 (plan)

Meanwhile, some enterprises have accumulated rich leading experience both in the mastering of planned capabilities (Plunge in the Lithuanian SSR, Urozhaynaya in Krymskaya Oblast and Vendichany in Vinnitskaya Oblast in the Ukrainian SSR) and in the carrying out of modernization work (Bolshevo and Ramenskoye in Moscow Oblast, Chernigov in the Ukrainian SSR and others). This experience must be studied and adopted and more attention must be given to worker training, to creating the required working conditions for the workers and specialists and to issuing incentives to leading workers, especially youth, for successes realized in carrying out their work.

An increase in the production of goods by the mixed feed industry and improvements in quality can and must also be achieved through the introduction of new equipment and a progressive technology at the enterprises, through the mechanization and automation of the production processes and through the introduction of scientific organization of labor.

Each engineering-technical worker is obligated to study the new and progressive technological methods and to teach them to others, to carry out a systematic search for the means and methods for achieving more complete utilization of internal reserves and to perform tireless work in behalf of strengthening production discipline.

in the socialist competition for successful fulfillment of the orders of the animal husbandry branch and for the timely delivery of products to the kolхозes and sovkhozes, the workers in the mixed feed industry must follow the motto 'Not one backward enterprise.' The party, professional trade union and komсомол organizations and the leaders of all of the mixed feed enterprises must determine in an accurate manner not only the limits for their own collectives but also those for each specific worker, foreman, engineer and each brigade. To raise each backward enterprise to the level of the leading ones -- this would be equivalent to supplying the country with a considerably quantity of additional mixed feed, BVD and premises.

The country is at the starting line for the Eleventh Five-Year Plan. The limits for further forward movement were outlined in the plan of the CC CPSU for the 26th party congress entitled "Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and For the Period Up To 1990."

The workers at enterprises and organizations of the USSR Ministry of Procurement, similar to all Soviet people, welcomed this very important party document with a great amount of enthusiasm. Within the labor collectives, a business-like and specific discussion is taking place on the program advanced by the party for the country's economic and social development. This discussion must be coordinated with the tasks of the collectives aimed at further improving production, introducing leading experience into operations and eliminating shortcomings and derelictions and the fulfillment and over-fulfillment of the obligations adopted in honor of the 26th party congress.

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LIVESTOCK FEED PROCUREMENT

PROBLEMS REMAIN IN SWINE FEEDING CONCEPTS

Moscow SVINOVODSTVO in Russian No 3, Mar 81 p 30

[Article by A. Makarkin, VNIETUSKh (All-Union Scientific Research Institute of Operational-Technological Control of Agriculture?): "The Organization of Feed Production on Hog Farms"]

[Text] In order to accomplish the tasks set for kolkhozes and sovkhoses with respect to increasing pork production, they must have a good feed foundation. The most important way to create this is to increase agricultural crop yields. More complete feeds of improved quality will be required for the continued intensification of production. Only then will the kolkhozes and sovkhoses be able to reduce feed outlays per unit of animal husbandry products, reduce monetary outlays for the purchase of various kinds of feed additives and increase production effectiveness overall.

Scientific and technological progress in swine production requires the following of the organization of the feed foundation:

a) Feed must be produced in a quantity corresponding to the planned production volume. Violation of this requirement results in a drastic drop in production effectiveness.

b) Public animal husbandry must receive an uninterrupted and regular supply of feed. It is especially important that this requirement be observed for the industrial-type swine production technology, which is based upon and calls for smooth and regular pork production.

c) The feed balance structure must provide for the delivery of inexpensive, quality feed components.

Despite the fact that certain successes have been achieved in the development of swine production, the productivity of the animals is still low on many kolkhozes and sovkhoses. The farms are delivering to the meat processing combines a large quantity of animals not brought up to slaughtering condition. The low live weight and leanness of the animals is due primarily to the inadequate feed base and the fact that they are not properly fed. It is therefore very important to focus all the efforts of kolkhoz and sovkhos workers upon the continued strengthening of the feed foundation for swine production.

The kolkhozes and sovkhozes have enormous possibilities for increasing the production and procurement of quality feed. The universal intensification of crop production is now under way, greater quantities of fertilizer are being applied each year, the agricultural practices used in the cultivation of crops are being improved, areas sown to high-grade feed are being increased, and other steps are being taken to raise farm crop yields and to increase gross harvests.

The rations fed to hogs on different farms differ greatly with respect to their various ingredients. Some farms (swine production complexes) fatten the animals mainly on balanced rations and concentrates, while others feed their hogs succulent feed as well. Properly organized feeding operations are based on rations consisting of an efficient combination of all feed ingredients in different ratios for the various age and production groups of livestock.

The most economically feasible way to fatten hogs is to feed them rations containing a large specific portion of grain and succulent feed adequate to provide variety and complete rations. The fattening of hogs with concentrates is the most advantageous with respect to the organization of production operations--the mechanization of feed preparation, the distribution of the feed, the cleaning of the premises and so forth. Consequently, it is economically most effective to fatten the animals with concentrates. It should be noted, however, that it is only expedient up to a certain point to saturate the rations with concentrates alone (without the necessary additives which are included during the production of balanced rations). A study of extensive data has shown that farms which feed rations consisting of 85-90 percent concentrates save on feed per unit of weight gain because of the nutritional value and have better production effectiveness as a whole.

Increasing grain production in every possible way is therefore an extremely important condition for the continued strengthening of animal husbandry's feed base. On many farms, however, feed grain is not produced in quantities adequate to provide a complete supply for the hogs. Grain and succulent feeds, by-products of the dairy, meat and fish industries and the like should therefore be more extensively used during the summer and winter for purposes of making more efficient use of and conserving feed grain. In recent years, unfortunately, research papers, literature on economics and animal husbandry and recommendations have placed the stress entirely upon increasing the portion of concentrates in the rations and upon the fattening of livestock with balanced rations. All of the plans for swine production complexes are practically designed for the use of balanced rations. The mistaken opinion has been created that it is generally impossible to set up industrial-type hog production using any types of feeds other than concentrates. The use of concentrates, as stated above, is unquestionably the most economical way to fatten hogs. In the future, all of the hog farms will use nothing but complete, balanced rations in their fattening operations. At the present level of development of agriculture, however, it is impossible for us to provide animal husbandry with all the grain it needs. Succulent and green feeds, which account for an insignificant portion of the rations fed to hogs, should therefore also be extensively used.

Experience has shown that the feeding of various types of feeds can be highly effective with the use of industrial-type technology. The hog production complex on the Sovkhoz imeni 50-letiya SSSR in Kalininskaya Oblast, for example, feeds more than 15,000 tons of food scraps, 6,000 tons of dairy by-products, around 1,000 tons of fish scraps, 5,000 tons of potatoes and other root crops, and 1,000 tons of grass meal annually, along with concentrates. This farm is one of the best in the nation, according to all the basic economic indices.

The inadequate supply of feed for hogs is the main reason for the poor productivity of the animals and for the large outlays of feed and other materials for pork production. Furthermore, the cost of producing the feed is relatively high. In 1978, for example, it cost 6.3 rubles to produce one quintal of grain on kolkhozes of the RSFSR and 6.9 rubles on the sovkhozes, and 11.5 and 12.3 rubles respectively to produce a quintal of potatoes. The continued reduction of production costs and outlays of feed for pork production will help to improve economic indices for hog production.

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NEW UNIFIED RULES FOR DELIVERY, ACCEPTANCE OF CATTLE DISCUSSED

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 2, Feb 81 pp 39-42

[Article by Yu.V. Tatulov, candidate of agricultural sciences and N.I. Kuritsyn, candidate of agricultural sciences of the All Union Scientific-Research Institute of the Meat Industry; Ye.G. Shumkov, candidate of biological sciences, Ye.A. Shklovskiy and V.P. Yakimov, candidate of agricultural sciences of the Kompleks Scientific-Production Association of the Poultry Processing and Gelatin Industry: "On the Unified Rules for the Delivery and Acceptance of Cattle"]

[Text] In conformity with an order handed down by the USSR Council of Ministers, the Unified Rules for the Delivery and Acceptance of Cattle and the computations based upon the weight and quality of meat were developed and have been in force since 1 January 1981. As a result of this, the republic rules which prevailed earlier are no longer in force.

The unified rules have been approved by the USSR Minzag [Ministry of Procurement], USSR Minsel'khoz [Ministry of Agriculture], USSR Minmyasomolprom [Ministry of the Meat and Dairy Ministry], USSR Minfin [Ministry of Finance] and the USSR CSA. This is a normative document in which inter-departmental conflicts are reduced to a minimum, thus making it possible to view the rules as the foundation for raising production discipline during the procurement, acceptance and processing of cattle. In addition, the approval of the unified rules served to complete the almost full conversion of enterprises and farms throughout the country over to the delivery of cattle according to meat and it confirmed the organizational and economic efficiency of this method. The thrust of the unified rules is directed towards reducing losses and preserving the quantity and quality of the cattle raw materials and the products obtained from them. This derives from the fact that an evaluation of cattle based upon the quantity and quality of the meat is more objective; the profitability indicators are not dependent upon the degree to which the gastro-intestinal tract is filled or upon resorting, which is observed when determining the state of nourishment of live cattle. The contents of the gastro-intestinal tract, even following the specified deductions, constitute 10-20 percent or more of the live weight and resorting -- 10-50 percent [1].

The acceptance of cattle according to meat eliminates the vicious practice of overfeeding animals on the day they are to be delivered for the purpose of raising the live weight. In the process, the need for restoring the losses in live weight which occur as a result of the natural functioning of the animals during

transportation is eliminated and greater responsibility is displayed with regard to adhering to the daily and hourly schedules for the delivery and processing of the cattle.

An analysis carried out by VNIIMP [All-Union Scientific Research Institute of the Meat Industry] on a comparative evaluation of two methods for the delivery and acceptance of cattle revealed that, as a result of a reduction in feed consumption and in expenses for the procurement, delivery and acceptance of cattle and also tending them at meat combine bases, during a period of forced delays, the meat industry realizes a savings during the acceptance of cattle according to meat of 5 rubles and 34 kopecks for each ton of processed meat [2]. In a computation for the annual volume of processed meat, this represents a savings of more than 41 million rubles.

Experience has shown that delays in the handling of cattle at the bases are reduced to a minimum when they are delivered on the basis of meat. Such delays occur as a result of the suppliers failing to adhere to the agreed upon delivery schedules for the cattle or breakdowns occurring at the meat combines. In connection with the reduction in the incidence of forced delays in the handling of the animals, there is no longer as great a requirement for procuring a large quantity of feed for the meat combines.

According to existing norms and in the case of 1 day's delay in the handling of the animals, 0.04 and 0.05 tons of hay are required respectively for large-horned and small-horned cattle and 0.025 tons of mixed feed are required for hogs, per ton of live weight [3].

Computations carried out in 1973 revealed the following: if all of the cattle delivered for processing during the year were delayed at the meat combine bases for just 24 hours, approximately 300,000 tons of feed units valued at up to 25 million rubles would be required to feed them. The rational use of the daily expenditure of feed could provide the country with up to 30,000 additional tons of weight increase in large-horned cattle and this would amount to approximately 15,000 tons of beef [4].

Similar computations carried out based upon the materials of an analysis of a possible one-time overfeeding of animals prior to their being shipped from the farms (in order to raise the delivered live weight) revealed that up to 130,000 tons of feed units are expended for the entire volume of cattle delivered for slaughtering. The productive expenditure of this feed could produce approximately 13,000 tons of weight increase in large-horned cattle, that is, approximately 6,000 tons of beef [4]. These computations are confirmed by a number of works, all of which reflect the effectiveness of the method of cattle delivery and acceptance according to meat, which has been legalized at the present time in the unified rules [2, 5, 6]. It should be borne in mind that any rules can exert a positive effect on production provided they are observed in a strict manner. Thus, commencing with the moment that the unified rules were first introduced, measures were required for ensuring that they were studied in the various areas and circulated in the quantities required for ensuring that each meat combine and each farm supplying cattle for slaughtering were supplied with them. Seminars and production conferences must be conducted on a periodic basis for those workers

engaged in the delivery and acceptance of cattle. The "bottlenecks" and possible causes of violations of the unified rules must be revealed during these seminars and conferences. This is required in particular owing to the fact that a number of difficulties can arise during the course of carrying out individual aspects of the rules, which are not always dependent upon those workers engaged in the delivery and acceptance of the cattle. Let us examine some of these. For example, Point 1.3 calls for the supplier farms to be provided with special standard earmarks or tattooing stamps with the letter of the farms. However, not all of the farms have as yet been provided with such earmarks and stamps. The problem of their manufacture requires an urgent solution on a centralized basis. Points 1.4 and 1.5 call for enterprises of the meat industry to be assigned raw materials zones in the established manner. However, up until recently, recommendations still had not been developed for ensuring mutual coordination of the productive capabilities of farms and enterprises, which would promote uniform deliveries of cattle and their rhythmic processing throughout the year.

Point 1.6 warrants special attention. It controls the work of those permanent representatives who are responsible for organizing and controlling the delivery and acceptance of cattle and the computations for them in terms of the quantity and quality of the meat. These representatives, as pointed out in the rules, must be highly qualified in their specialties: veterinary doctor, zootechnician, engineer-technologist of the meat industry. Unfortunately, this service is not independent but rather is directly subordinate to the agricultural organs and this can adversely affect objectivity when evaluating violations in which the interests of the suppliers and receivers of the cattle are in conflict with one another. Thus the people assigned to this post should possess a great amount of operational experience and they should be distinguished by a high level of competence, high principles and honesty. They must first of all protect state interests and not just limited departmental interests, since violations of the rules can be two-sided in nature. Therefore, on each occasion the violators must be exposed regardless of their departmental subordination.

Ideally, prior to being assigned to work, the permanent representatives should undertake a course of study in the organs of the State Inspection of Agricultural Products of the appropriate instructions and normative documents which regulate the delivery and acceptance of cattle according to meat quality and quantity. Importance is attached to ensuring that not one incident of a violation taking place passes unnoticed and that the proper moral or material punishment is handed down.

The service of permanent representatives must bear in mind that a violation of any point in the rules which falls within its competence leads to losses in products, the preservation of which affects the economic indicators of the supplier-farms for the cattle and enterprises of the meat industry and, in the final analysis, the supplying of the population with a valuable food product that is in short supply -- meat. Thus, failure to carry out the cattle delivery schedules on a timely basis, incorrect formulation of the accompanying documentation or its absence entirely, failure to sort the animals on the farm by weight and sex-age groups and the absence of earmarks and stamps (Points 2.1 and 2.2) inevitably lead to delays in the handling of the cattle and, as a result, either to losses in meat or to irrational feed consumption. A reduction of just 1 percent in losses caused by the untimely

delivery-acceptance or processing of cattle will produce a savings of up to 10 kilograms of meat for each ton of live weight of cattle. With regard to the tremendous volumes of cattle procurements for the country as a whole, strict observance of the hourly schedules for delivering and processing them can save tens and hundreds of thousands of tons of meat for the consumer.

When use is made of the unified rules, a certain weakening of the requirements is permissible in connection with the integument of animals during pregnancy. This derives from the fact that when paying for cattle according to meat, the deductions for bulk and for delivering females during the second half of the fetal development period, in a computation for the weight of the carcasses, are not taken into account. All other all-union normative documents which regulate the delivery and acceptance of cattle establish sanctions in the form of fines for the mentioned violations.

A system of fines should ideally be developed for use when cattle are delivered according to meat, with fines being issued for each violation and also in the form of the deductions now in use. However, these deductions should not be from the actual but rather from the credited live weight of the cattle, based upon the number of animals with bulk and carcasses with fetuses according to their credited weight and average state of nourishment. In addition to deductions for the content of the gastro-intestinal tract, the plans presently call for a 1 percent deduction for bulk and a 10 percent deduction for the delivery of females during the second half of pregnancy, from the live weight. Such deductions are called for in the special conditions for the delivery of livestock, poultry and rabbits, for each pregnant animal delivered during the second period of fetal development. The age of the fetus can be determined by an internal inspection of the carcasses by workers of OPVK [Department of Industrial Veterinary Control] of the meat combine, jointly with representatives of the suppliers, and this must be entered in the appropriate document [7]. An equally important task of the permanent representatives is that of ensuring, jointly with the meat combine workers, the preservation for the suppliers of the batches of cattle and the meat obtained from them up until they are delivered to the freezer, the observance of priorities in delivering the batches for slaughtering depending upon the time of their acceptance and also observance of the pre-slaughtering technology for the maintenance and processing of the cattle, correct evaluation of quality and the results of weighing the carcasses, meat cuts and stripping away of the lard, monitor the timeliness and correctness of the computations and the use of sanctions for violations committed.

Special attention must be given to the observance of Point 2.3, which calls for an understanding to be reached regarding the minimum processing volume for cattle delivered. This point has to do with uniformity in the delivery and processing of cattle and this is directly related to the delays which occur in the acceptance and examination of the cattle at bases of the meat combines. When concluding contractual agreements for cattle deliveries, a stipulation must be made as to the minimum size of a batch and the fine sanctions to be employed when this point is violated, in accordance with "Special Conditions for the Delivery of Cattle, Poultry and Rabbits" and "Statute on Deliveries of Products of a Production-Technical Nature."

Point 3.13 must necessarily be carried out. It authorizes a meat combine, in questionable cases, to carry out controlled weighings and to determine the state of

nourishment of cattle prior to their acceptance. Thus, in conflicting situations, the raw materials will be paid for not on the basis of the data in the herd register, but rather based upon the results of a controlled check, formulated in an appropriate document by the interested parties.

Special attention should be focused on Point 3.17, which calls for control over the age of young bulls, which are subject to acceptance based upon the procurement prices for a high state of nourishment. Following slaughtering, the age of the animals is determined more easily based upon the condition of the tooth arcades. This method should be employed in questionable cases, when the animals are listed as young stock in the herd register when actually they are more than 3 years of age. No additional payments for heavy weight should be made for such animals.

Point 3.26, which is aimed at reducing the pre-slaughtering seasoning of large and small-horned cattle, horses and camels to 24 and hogs -- to 12 hours, is viewed as an important new innovation. This conforms fully with the modern data on the direct dependence of the amount of raw material losses upon the duration of the pre-slaughtering seasoning [8]. This point is supplemented by Point 3.27, which regulates the minimum period of pre-slaughtering seasoning (5 hours) for animals received from animal husbandry complexes, the fattening technology of which called for seasoning without feed but with unlimited watering for large-horned cattle of 15 hours and for hogs -- 5 hours.

In connection with the raised requirements for protecting the raw materials, checks must be carried out at all of the meat combines on the condition of the pre-slaughtering bases. They must have water available and enclosures for the separate maintenance of animals belonging to the farms and also sheds and covered facilities. The weighing equipment must also be inspected and placed in proper operating condition, especially at those levels in the technological process where disagreements may arise between the interested parties.

Importance is attached to ensuring that each and every violation is examined, commencing with the very first days of work with the unified rules. Where conflicts arise as a result of readings or the absence of certain points in the rules, requests should be submitted in the prescribed manner asking for further clarification and the introduction of supplements to the rules at the inter-departmental level.

The placing in operation of the unified rules is creating favorable conditions for planning cattle procurements in the indicators of slaughtering weight and this is making it possible to ignore the incomplete system of crediting coefficients for calculating the weight of meat in live bulk, which is presently being used for reporting fulfillment of the cattle procurement plan [9].

The USSR Council of Ministers, by agreement with USSR Gosplan, USSR Minzag, USSR Minsel'khoz, USSR Minmyasomolprom and the USSR CSA, adopted the proposal of the Council of Ministers of the Latvian SSR and the Council of Ministers of the Estonian SSR concerning the carrying out of an experiment in these republics in 1981 and 1982 on the planning and accounting for cattle, poultry and rabbit procurements in dressed weight. A question arises in this regard concerning the development of rules for the delivery and acceptance of agricultural poultry and

rabbits and the computations for them according to the quantity and quality of meat, with their subsequent inclusion in a section of the unified rules.

At the present time, all poultry and rabbits being supplied to poultry processing enterprises are being accepted on the basis of live weight. In the process, the sorting of the live poultry in accordance with State Standard 18292-72 entitled "Agricultural Poultry for Slaughtering" is for all practical purposes not being carried out; only the overall weight of a newly received batch is being recorded. This is explained on the one hand by an imperfection in the present State Standard 18292-72, in which objective criteria for evaluating the nutritional state of poultry are lacking and, on the other, by the absence of differentiated prices for live poultry based upon quality categories. In addition, the increasing volumes of poultry production are resulting in large volumes of one-time deliveries and this is inhibiting the sorting of the live poultry. This is bringing about a considerable increase in the deliveries of lean poultry for slaughtering and a lowering of the volume of poultry which produces 1st grade meat. Thus the amount of meat obtained from poultry in a lean state of nourishment has ranged from 4 to 8 percent for a number of years [10]. In the case of chicks, the production of 1st grade poultry meat does not exceed 10 percent, broiler-chicks -- 22 percent, chickens -- 38 percent, geese -- 29 percent, ducks -- 22 percent, ducklings -- 24 percent and turkeys -- 17 percent.

It has been established that when chicks are slaughtered at a live weight of less than 600 grams, the production of meat in a lean state of nourishment reaches 74 percent [10].

Thus, an increase in the production of well nourished poultry is dependent to a considerable degree upon raising the quality requirements for new raw materials being received. This can be achieved by a system of accepting and paying for the poultry based upon the quality and quantity of the meat, that is, all poultry must be evaluated according to a standard for meat.

When such an evaluation is employed, a considerable reduction will take place in the sorting of the poultry according to quality (standard and lower than the standard requirements), the deduction for the contents of the gastro-intestinal tract will be eliminated and the poultry will be paid for in conformity with its quality according to the categories for state of nourishment. On the one hand, this will raise the material responsibility of the supplier-farms for the quality of their poultry raising and fattening operations and, on the other, it will increase the responsibility of the meat industry enterprises for the quality of the meat processing work.

The economic effect from the use of this system for the issuing and acceptance of poultry according to the quantity and quality of the meat can be determined based upon the aggregate indicators for payments to the supplier-farms for poultry delivered and to the poultry processing enterprises for the production of meat, feather and down materials and the by-products of evisceration.

Some poultry processing enterprises are paying for the poultry not on the basis of the actual weight but rather an accepted live weight, obtained as a result of converting the meat obtained from a given batch of poultry into a computed live weight. For this purpose, use is made of coefficients which provide an inverse value for the approved norms for meat yield. For example, if the norm for meat

yield is 80 percent of the accepted live weight, then the conversion coefficient will equal 1.25 (100 : 80). Hence, for each quintal of meat obtained, a farm will be paid for 1.25 quintals of accepted live weight, regardless of the actual weight. In the case of poultry which produce a higher yield of meat, the live weight will deviate from the actual weight with a plus and poultry which furnish lesser yields -- with a minus.

This practice of making payments based upon slaughtering results and the procurement prices for live poultry, despite the fact that it reflects a mutual desire on the part of the sides to evaluate and pay for the products delivered in an objective manner, nevertheless is not called for in the all-union normatives and is considered to be only a half-measure. The introduction of procurement prices for poultry meat which will ensure equivalent payments for live poultry and the conversion over to the delivery and acceptance of poultry based upon the quantity and quality of the meat are considered to be more correct measures.

In 1974 and 1975, the Kompleks NPO [Scientific-Production Association] submitted plans and methods for use in connection with the procurement prices for poultry meat, rules for the delivery and acceptance of poultry and computations based upon the quantity and quality of the meat [11]. In 1977 and 1978, plans were developed for the procurement prices to be used in various raw material zones of the country (RSFSR, Moldavian SSR, Lithuanian SSR, Belorussian SSR) [12]. Experimental work was carried out which revealed the possibility of protecting the batches of poultry and meat belonging to the suppliers [13].

These plans for normative documents, which have been approved by Minmyasomolprom for the RSFSR, the Ukrainian SSR, Lithuanian SSR and the Moldavian SSR, have not yet been agreed upon from an interdepartmental standpoint owing to the inadvisability of creating new procurement prices for poultry meat.

One inhibiting factor with regard to converting over to the delivery and acceptance of poultry based upon meat, under the conditions of planned procurements according to live weight, was an imperfection in the system for converting the weight of the meat of animals into live weight. In this regard, proposals have been expressed aimed at returning to the system of delivering and accepting cattle on the basis of live weight in all areas, particularly when it is accepted directly on the farms. This may also explain the extended delay that has taken place in obtaining approval for the unified rules. Under such conditions, the conversion over to the delivery and acceptance of poultry and rabbits and the computations for them based upon meat turned out to be premature for many.

At the present time, following approval of the unified rules and the planned experiment in converting enterprises and farms of the Latvian SSR and the Estonian SSR over to cattle, poultry and rabbit procurements in indicators of slaughtering weight, approval must be obtained under production conditions for the plans and methods for computing differentiated procurement prices for poultry meat, existing and planned prices, the rules for the delivery and acceptance of poultry and the computations for it based upon meat. A study must be undertaken of the possibility of planning procurements in indicators of slaughtering weight. Moreover, these problems must still be worked out for the very first time for rabbit procurements. All of the works planned must be carried out from the very beginning on an inter-

departmental level, with participation by the scientific institutes subordinate to USSR Gosplan, USSR Minsei'khoz, USSR Minzag, USSR Minmyasomolprom and the USSR CSA, such that with agreement being reached on the normative documents and proposals, there will be a minimum of discrepancies during the final stage.

The development of unified normative documentation for the delivery and acceptance of cattle, poultry and rabbits (both at meat combines and directly on the farms) and the computations for them, based upon the quantity and quality of the meat, will undoubtedly exert a considerable stimulating effect with regard to raising the quality and preservation of the raw materials of the meat industry. This conforms fully with those state requirements which must be met when carrying out agro-industrial tasks associated with ensuring that the country's population is properly supplied with meat.

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INDUSTRIAL PRODUCTION OF PORK BASED UPON USE OF FOOD BY-PRODUCTS

Moscow ZHIVOTNOVODSTVO in Russian No 2, Feb 81 pp 44-46

[Article by P. Smirnov, hero of Socialist Labor and director of the Sovkhoz imeni 50-letiya SSSR, Kalininskaya Oblast: "Industrial Production of Pork Using Food By-products"]

[Text] In 1964, a decision was adopted calling for the creation in Kalininskaya Oblast of a combine for the production of pork and the construction in the city of Kalinin of the leading Zavolzhskiy Sovkhoz for the industrial fattening of hogs based upon the use of food by-products. The fattening farm was designed by the republic's Rosgipronisels'stroy Institute.

At the time, the specialists attached to the sovkhaz and the planning institute and the scientists of a number of other institutes were confronted with the task of creating a basically new enterprise having a production line technology, rhythmic production operations and new forms for the organization of labor and control.

It bears mentioning that at the time there was neither experience or finished models relating to this type of farm, although individual elements of the fattening technology involving the use of food by-products and the mechanization of production operations at large hog fattening sovkhazes in Moscow Oblast (Znanya Oktaybrya, Belaya Dacha, Ostankino, Krasnyy Luch) and Leningrad Oblast (Shushary, Pobeda and others) warranted attention. They were used in the planning for a fattening farm in our oblast.

For example, the plan was based (with subsequent and substantial improvements) on a technology for processing food remnants which was employed in a feed preparation shop of the Belaya Dacha Sovkhoz; the principle of finished feed mixtures being supplied to a pigsty via a pipe feedline was adopted from the Ostankino Sovkhoz. It was on this basis that a new variant for a mixed feed distributor was subsequently created. At the time, manure was being removed from pigsties at the Znanya Oktyabrya Sovkhoz using the water flow method and by no means was it an efficient system. The plan also called for the hydraulic removal of the manure, but with another technical method being employed.

After summarizing the experience available at the time and also individual elements of the hog fattening technology which warranted attention, the sovkhaz and planning institute specialists and also the scientists performed a great amount of work in

connection with the creation of a new industrial technology for the production of pork.

Many technical solutions and zoo-hygienic parameters were created and supplemented during the course of construction and operations and also as a result of the carrying out of certain scientific studies. Initially the technology called for young stock to be imported from other farms and fattened on food remnants and concentrates. The purchasing of young pigs for pre-fattening purposes from other sovkhoses in the oblast had a number of negative aspects: first of all, the supplier-sovkhoses often failed to adhere to the schedules established for delivering the young pigs, the quality of which was low and quite varied; secondly, the transporting of the animals over great distances involved greater expenses, stresses which the animals had to endure and also the danger of the animals contacting infectious diseases. All of this led to the need for building their own reproduction farm.

The placing in operation of their own reproduction farm, built according to a Sevsapigprosel'khozstroy, brought about a sharp improvement in the pork production technology and it exerted a noticeable effect on growth in all of the zootechnical and economic indicators.

However, the renewal of the brood stock using replacement hogs obtained from other breeding sovkhoses also involves substantial shortcomings which tend to lower the effectiveness of the technology created.

In this regard, a decision was made to build a breeding farm for 220 sows. The placing in operation of this farm in 1978 solved the task of supplying the reproduction farm with pedigree replacement hogs.

Thus, the single technological production line that was created, involving complete turnover of the herd, commenced functioning in a normal manner and began furnishing perceptible results. In 1979, 82,780 young pigs were obtained compared to only 58,600 in 1975 and 9,348 tons of pork were sold to the state compared to only 4,500 tons in 1970. The increase in pork production volumes is constantly being accompanied by improvements in the economic indicators.

Thus the average daily increase in live animal bulk during fattening carried out in 1965 amounted to 459 grams and in 1970 -- 502 grams, in 1975 -- 530 grams and in 1980 -- more than 600 grams. Feed expenditures per quintal of weight increase decreased from 657 feed units in 1965 to 479 in 1979. Labor expenditures decreased similarly from 11.9 man-hours to 1.68. The annual profit from pork production was 6.5 million rubles and the level of profitability -- 78 percent.

The improvements in the economic indicators of pork production took place mainly as a result of the introduction of a progressive and highly effective technology. Its most valuable elements were developed and introduced into operations at a hog complex, by specialist groups at a sovkhos of Rosapronisiel'stroy, jointly with scientists of VIESKh (All-Union Scientific Research Institute of Rural Electrification). Thus, based upon the use of domestic equipment, an efficient technological line was created for the processing of food remnants, for the pneumatic delivery of these remnants to pigsties and for the distribution of the remnants within the pigsties.

The plans also called for the feed preparation shop to have a line for the processing and use, for feed purposes, of slaughtering-house remnants and the corpses of animals following disinfection. This exerted a positive effect on the economics of fattening and it made it possible to maintain a high veterinary-sanitary level.

The technology for processing food remnants has provided the basis for the standard plans for feed preparation shops which are being employed extensively in many oblasts of the country.

The sovkhos annually uses up to 25,000 tons of food remnants, obtained from the population, from dining halls and restaurants in the city of Kalinin and also from enterprises which process agricultural raw materials. The proportion of remnants in the rations of hogs undergoing fattening is 15-18 percent. The farm obtains approximately 1,000 tons of pork from these food remnants alone. In addition and distinct from other industrial complexes, the sovkhos uses up to 5 percent for the nutritional value of internally produced feed: vitamin-grass meal, potatoes, root crops, grain waste products and others.

The Chief Engineer of the sovkhos, A. Yankovskiy, jointly with VIESKh specialists, created a new and unique mixed feed distributor which makes it possible to supply the animals with a mixture of food remnants and mixed feed of any consistency. This feed distributor has been performing in a reliable manner at the complex for 10 years and it is valued highly by specialists and delegations which visit our sovkhos. Unfortunately however, it has still not been assigned to series production.

The specialists at the sovkhos and scientists of VIZh [All-Union Scientific Research Institute of Livestock Breeding] developed and introduced an efficient system for carrying out breeding work and reproduction of the herd, for raising pedigree replacement hogs and for improving the breeding stock of the reproduction farm through the addition of such animals. The breeding of pure-bred hogs of the large white strain was organized and use was made of two and three-strain crossings.

A rational system for hog maintenance, for various sex and age groups, was developed and introduced into operations. Fixed maintenance was employed for sows during farrowing, in sovkhos designed stalls. Taking into account the quality of the feed, the weaning of the suckling pigs away from their sows was carried out when they were 42-45 days of age. Distinct from other complexes, pasture maintenance is being used for replacement and pregnant sows on gardening sites. Studies have been carried out over a period of many years in the interest of determining the optimum size for groups of hogs undergoing fattening and also the optimum parameters for the micro-climate in various production facilities. As a result, it was established that the best indicators were obtained for groups consisting of from 20 to 40 hogs and that this provided a good basis for the planning of facilities. It was also revealed that different air temperature regimes exert different effects on the growth, development and physiological condition of young pigs. Based upon the results of these studies, a changeable temperature regime was developed and introduced for the various production facilities.

As a result of extended research, floors made out of silicate brick were introduced into use at the complex for the very first time. In terms of their hygienic and

economic indicators, these floors are superior to concrete, asphalt and wooden floors. Asbestos-cement piping, sawed off lengthwise, are used as feeding troughs.

The specialists at the sovkhos, jointly with workers attached to Rosgipronisels'troy, developed a basically new technology for fattening hogs in mobile containers that are connected up to a conveyer line. Distinct from the traditional floor-type maintenance, the essence of this technology consists of raising the young stock in cages arranged on two levels, with the cages being connected to a supporting conveyer line, which is operated twice daily for the purpose of supplying feed and removing waste products.



Figure 1. Graph on growth in output production at the sovkhos

Key:

I. Number of hogs (thousands of head), average daily weight increase (grams)

II. Pork production (tons)

III. Profit obtained (thousands of rubles)

Such a technology for the fattening of hogs is employed in a 5-level automatic pigsty built at the sovkhos. Complete mechanization of all production processes has been achieved and there is automation and television, construction expenses were lowered up to 25 percent and more favorable hygienic working conditions are being created for the service personnel.

With the participation of VNIIVS [All-Union Scientific Research Institute of Veterinary Sanitation] scientists, the specialists at the sovkhos developed and introduced a rational system for the veterinary protection of the complex against infectious and parasitic diseases. A system of veterinary-sanitary control was created for monitoring the health of the hogs and the quality of the feed and purification installations, thus making it possible to maintain the veterinary well-being of the herd and a high level of sanitary culture.

It is known that the problem of processing and utilizing the sewage water of animal husbandry complexes has still not been solved completely. The specialists at the sovkhos-combine, together with workers attached to Rosgipronisels'troy, created for the first time under production conditions a hydraulic system for the removal, transporting and utilization of sewage water, one which differs favorably from those systems presently in use at hog raising complexes.

As a result of scientific studies, a hydro-floating method was proposed for removing manure from pigsties, with the amount of water required for removing the manure be reduced by threefold compared to the hydro-washing off method. At the present time, the water expenditure rate is 5 liters daily per animal.

In order to separate the sewage water by stages, horizontal concrete sedimentation-accumulation tanks were built for the very first time in domestic hog raising practice. These tanks are simple of design and reliable of operation. The effectiveness of separation by means of gravity is 70 percent.

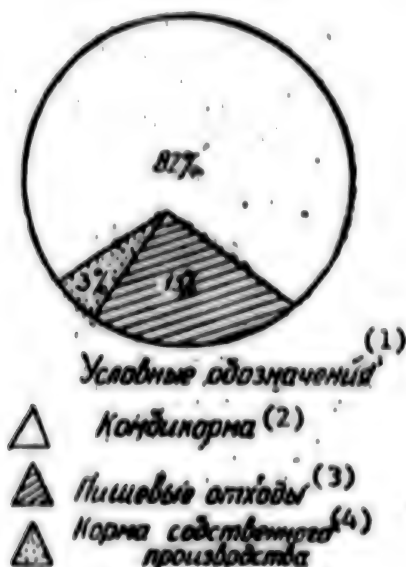


Figure 2. Feed structure for hogs

Key:

1. Arbitrary designations
2. Mixed feed

3. Food remnants
4. Internally produced feed

Over a period of 35 hours the solid sediment in the sedimentation tank is dehydrated by means of drainage to a moisture content of 73 percent. In the process, the sediment assumes the form of a pile, is subjected to biothermal treatment and is suitable for transporting. At the sovkhos, 22 tons of this sediment are applied per hectare of arable land annually (there are 2,000 hectares). This made it possible to create a high level of soil fertility and to obtain 30-33 quintals of grain and 200 quintals of potatoes from each hectare.

Utilization of the liquid stage of the manure is being carried out on specially allocated technological lands beyond the limits of the farm's crop rotation plan. A special 8-field crop rotation plan for feed has been created, effective crops selected and an irrigation technology and norms developed.

The system for utilizing drainage is making it possible to make maximum use of sewage water for fertilization purposes, to obtain additional feed for the animals and to ensure protection against environmental pollution.

Each year the farm obtains from its lands that are irrigated with sewage water, land that was formerly worthless, approximately 12,000 quintals of feed units, or 36 quintals from each hectare.

In addition to the mentioned institutes, the Council for the Technology for Producing Animal Husbandry Products on an Industrial Basis of VASKhNIL, Gipronisel'khoz, the Kalinin Polytechnical Institute, the Kalinin Agricultural Institute and others also participated in creating a domestic and scientifically sound technology for industrial hog raising at the complex of the Sovkhoz imeni 50-Letiya SSSR.

As a result of the great amount of work carried out at the Sovkhoz imeni 50-Letiya SSSR in Kalininskaya Oblast, a scientifically sound domestic technology has been created for the industrial production of pork, based upon the use of food remnants and internally produced feed.

The Presidium of VASKhNIL has recommended that Glavsel'stroyproyekt of the USSR Ministry of Agriculture use the technology of the complex at the Sovkhoz imeni 50-Letiya SSSR in Kalininskaya Oblast for developing a standard plan for hog complexes in suburban zones, with food remnants being used in the animal feed.

The leadership and specialists at the sovkhov, with the active participation of the scientists, are striving to improve the system of breeding work, the feeding and maintenance of the animals and also the system employed for removing, transporting and utilizing sewage water and they are also attempting to mechanize the production processes more completely. These actions will make it possible to increase the production of pork during the new five-year plan.

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AGRO-ECONOMICS AND ORGANIZATION

ESTONIAN OFFICIAL URGES FUEL ECONOMY IN AGRICULTURE

Moscow SEL'SKAYA ZHIZN' In Russian 3 Apr 81 p 2

[Article by V. Rayevskiy, Estonian SSR deputy minister of agriculture: "On Saved Fuel"]

[Text] Agriculture is one of the main consumers of liquid fuel in Estonia. Thrifty expenditure of it in the branch is becoming especially important. The kolkhozes and sovkhoses can make a large contribution to meeting those requirements for saving on fuel and energy resources which were set by the 26th CPSU Congress.

There are many opportunities for this. Economy begins with correct operation of the machine and tractor fleet. This is especially important now when the energy availability for its labor is increasing rapidly and the farms are receiving powerful tractors, highly productive feed harvesting machines, and new grain and potato harvesting combines.

Organizing work according to the method of the machine operators of the Ipatovskiy Rayon in Stavropol'skiy Kray helps to utilize modern equipment efficiently. Last year, for example, 890 mechanized groups were doing spring field work on the farms of the republic, 644 harvest and transportation detachments were engaged in harvesting grain crops, 500 in harvesting potatoes and 791 detachments in procuring feeds. In many of these collectives the output per grain combine for the season amounted to 1,000 tons, and per potato combine--1,300 tons. In the best detachments the self-propelled feed procurement machines harvested the grass from 1,000-1,100 hectares during the season. The idle time of machines was reduced to a minimum here and, consequently, non-productive expenditure of fuel was also reduced to a minimum.

Technical rearmament of agriculture in the republic has also required a strengthening of the engineering and technical service on the kolkhozes and sovkhoses. More than 1,700 engineer-machine operators have been trained for agriculture by the Estonian Agricultural Academy and the Tikhemetsaskiy Sovkhoz-Tekhnikum graduates 250 technician-machine operators annually.

A task has been set to direct the efforts of this large detachment of specialists correctly and utilize their knowledge efficiently. The republic has adopted a rule: technical servicing of machines is carried out right on the farms. All kolkhozes and sovkhoses of Estonia have repair shops now. One should especially

notice the technical service points on the Vyayke-Maar'ya and Viru kolkhozes in Rakvereskiy Rayon, the Vayda Sovkhoz and the Kolkhoz imeni M. Lauristin in Khar'yuskiy Rayon. Under the Tenth Five-Year Plan 9-10 production bases for repair and technical servicing of the machine and tractor fleet were put into operation annually. All this made it possible during recent years to maintain the level of readiness of the machine and tractor fleet during field work at 97-98 percent. Under the Eleventh Five-Year Plan the network of standard repair and mechanics shops for the farms of the republic will be complete.

There is another peculiarity of agriculture in the Estonian SSR which affects both the level of operation of the machine and tractor fleet and efficient utilization of fuel. The fact is that the fields of the republic are filled with rocks. It is necessary to make additional expenditures, for otherwise the equipment will frequently be halted because of breakdowns, losses of the harvest will increase, and the expenditure of fuel per unit of output will also increase.

The efforts of the Special Design Bureau of the Estonian Scientific Research Institute of Farming and Land Reclamation, which developed models of various soil cultivation and planting machines with hydropneumatic rock protection devices, contributed to the introduction of a system of efficient expenditure of fuel on the farms. At specialized enterprises of the Estonian SSR Goskomsel'khoztekhnika, following blueprints from the Institute, production was promptly started on trailer equipment which is so necessary for field workers. Now all high-powered T-150K and K-700 tractors that come to the republic are equipped with plows and cultivators and adaptors for work on rocky fields.

A number of other organizational and technical problems have been solved. For example, the Estonian Scientific Research Institute of Farming and Land Reclamation has developed an automated control system for drying grain. Its introduction not only improves the quality of the products, but also makes it possible for the farms to save thousands of tons of fuel.

It is no less important, of course, for the farms to arrange to use the fuel they receive correctly. Everything is important here: transportation, storage and utilization of fuel and lubricants.

More than 70 percent of the petroleum products are delivered to the kolkhozes and sovkhozes by specialized transportation. For storing the fuel in rural areas 700 storehouses have been constructed and they have 7,200 distribution points. Fueling is carried out by the closed method everywhere. As a rule, motor oil is stored at technical service points.

The farms of the republic have been convinced of how important it is in organizing the struggle for saving fuel to have correctly arranged accounting. Unfortunately the rules that are usually in effect complicate accounting work and make it difficult for the machine operators to understand. The fuel is distributed in liters while the expenditure norms for fuel are set in kilograms.

Since 1973, as an experiment, the republic has changed over to accounting for the expenditure of fuel in volume units. As a result it became possible for each

machine operator and driver or any consumer who uses the services of the kolkhoz or sovkhos supply of fuel and lubricants to analyze the expenditure of fuel each month. According to calculations of economists, this measure made it possible to release about 100 accountants and transfer them to other jobs.

The handling of fuel on the kolkhozes and sovkhoses becomes more complicated from year to year. It becomes especially important to control its technical condition. Each year Gosssel'tekhnadzor conducts a technical inspection and its results are considered by the board of the republic Ministry of Agriculture.

Since 1975 technical service for petroleum storage facilities have been the responsibility of a specialized subdivision of Goskomsel'khoztekhnika. The time periods for technical service and repair of fuel and oil distribution pumps, and also control panels are determined by a republic schedule. They are also taken into account in agreements which are concluded between the farms and Goskomsel'khoztekhnika.

Mobile brigades of a special administration of Goskomsel'khoztekhnika take on responsibility for cleaning reservoirs and removing sludge. And there is a lot of it. The Tartuskiy Raysel'khoztekhnika has arranged the output of equipment for emulsifying wastes from the fuel of boilers (shale oil, fuel oil). But so far there is no answer to the question of what to do with wastes from gasoline and other light combustibles.

There are still shortcomings in supply. The demand for spare parts for fuel pumps is satisfied, as a rule, by one-third and for oil pumps--by even less. True, workers of the republic Goskomsel'khoztekhnika are not sitting with their arms folded. For example, rayon divisions have organized the output of rubber seals and filtering elements for pumps and containers for petroleum products, and they have arranged for the repair of the pumps' electric engines. But not all problems can be solved this way. In our opinion it would be expedient to organize the output of spare parts for rural storehouses for fuel and lubricants on a statewide scale.

The farms are making legitimate complaints against enterprises of Goskonnefteprodukt: it is not mandatory for them to produce a certificate of the quality of the fuel. Those kinds of oils and lubricants which the farms need in small quantities are not distributed in special or small containers.

There are difficulties. But they are all quite surmountable. During the past five-year plan the farms of the Estonian SSR have saved more than 10,000 tons of fuel--almost as much as is required to conduct spring planting in the first year of the new five-year plan. One out of five spring plantings using saved fuel--this is the task we are setting for the next five-year plan.

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AGRO-ECONOMICS AND ORGANIZATION

GRAIN PROCUREMENT FROM POPULATION

Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 3, Mar 81, p 15

[Article: "The Policy for Procuring Grain from the Population Through Consumers' Cooperatives"]

[Text] The USSR Ministry of Procurements in a letter of 4 October 1948, No. 8-12/715, announced to ministries of procurements of the union republics that consumers' cooperative organizations, beginning 1 October 1980 through 1 July 1981, are permitted to make grain procurements from kolkhoz workers, sovkhoz workers and other citizens, and also to sell the procured grain and the bread produced from it under the conditions set out in the letter of the State Procurements Committee of the USSR Council of Ministers of 28 December 1966, No. 1-17/287.

This letter explains that the procurement of wheat, rye, millet, feed barley, oats, corn and peas from kolkhoz workers, sovkhoz workers and other citizens is carried out at prices that are agreed upon, but which are not higher than procurement prices set for the grain of these crops that is sold by the kolkhozes to the state in excess of the plan in the corresponding zones, and for the other grain crops--at prices no higher than state procurement prices. Moreover it must be ensured that the grain is not sold at a loss and the bread produced from this grain should be sold to the population at state retail prices.

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AGRO-ECONOMICS AND ORGANIZATION

CALCULATING AND ACCOUNTING FOR LIVESTOCK PRODUCTION

Moscow ZAKUPKI SEL'SKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 3, Mar 81 p 23

[Article: "On the Policy for Receiving, Calculating and Accounting for Animal Husbandry Products"]

[Text] The editorial staff is receiving letters whose authors request clarification of certain issues regarding state procurements of excess animal husbandry products that come in from subsidiary agricultural enterprises, organizations and institutions, and accounts regarding them. Taking into account readers' wishes, we are publishing the corresponding clarification.

The USSR Ministry of Procurements, the USSR Ministry of the Meat and Dairy Industry and the USSR Central Statistical Administration explain (circulating letter of 5 November 1980, No. 8-14/783), that when subsidiary farms sell excess animal husbandry products to the state, regardless of whether or not they have been given a plan, the procurement organizations must fill out receipts for them, on the basis of which the rayon statistical administrations include them in the fulfillment of the plan by the farm or rayon. Accounts for these products are kept according to procurement prices that are in effect.

The only part of products from subsidiary agricultural enterprises that do not count for the state procurement plan are those that are accepted by procurement organizations so that these products can then be transferred to other regions of the country in keeping with schedules of allocations from USSR ministries and departments whose systems include these subsidiary farms. Payment for these products is made according to calculated prices. The difference between procurement prices and calculated prices is paid to the subsidiary farms out of the enterprises' profit.

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AGRICULTURAL MACHINERY AND EQUIPMENT

LEAD ARTICLE OUTLINES AGRO-MACHINERY PROGRESS, PROSPECTS

Moscow TEKHNKA V SEL'SKOM KHOZYAYSTVE in Russian No 2, Feb 81 pp 3-7

[Article: "A Program of Creation"]

[Text] The Soviet people are greeting the 26th congress of the Communist Party with glorious labor achievements. By implementing the economic strategy worked out at the 24th and 25th CPSU Congresses the workers, kolkhoz workers and intelligentsia have achieved continuous successes in the creation of the materials and equipment foundation for communism and in the improvement of the people's welfare under its tested leadership.

The 10th Five-Year Plan was successfully concluded. Our homeland has begun the 11th Five-Year Plan, a new and important stage in the building of communism.

"...Our Party's work and all of its endeavors are aimed at accomplishing everything necessary to improve the welfare of the people, are done for the sake of the people. This is the great, humanitarian objective of the Party which brings it close to the people, which links it with solid, indestructible bonds to all of the Soviet people," Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee, has stated.

This is convincingly demonstrated by the results of the 10th Five-Year Plan. Real per capita income increased by 17 percent, the average earnings of blue- and white-collar workers grew by more than 15 percent, the income of kolkhoz workers from public farming increased by 26 percent and sales of manufactured goods and foodstuffs to the population increased markedly over the figures for the Ninth Five-Year Plan.

Public funds for free education, medical assistance, pensions and other social provisions totaled 527 billion rubles during the last five year period.

Housing construction was conducted on a broad scale. A total of 530 million square meters of housing was built, as a result of which housing conditions were improved for 50 million people.

The national income increased by 400 billion rubles during the five-year period, compared with the previous five years.

Four fifths of this went directly into public consumption, housing, social and cultural construction.

The history of socialist development has known many examples of the accomplishment of large national economic tasks by the Party. Decisions adopted at the March 1965 Plenum of the CPSU Central Committee were of especially enormous importance for eliminating the gap between rapidly advancing industry, science and technology and lagging agriculture. They contained the principles underlying the contemporary agrarian policy. Since that plenum capital investments totaling around 400 billion rubles have been channeled into the development of agriculture. Its material and technological foundation is becoming increasingly industrialized. This has made it possible to increase agricultural output. The average annual grain harvest exceeded 200 million tons for the first time during the 10th Five-Year Plan. The cotton growing republics harvested a record crop of more than 9 million tons of raw cotton in the final year of the five-year period.

Capital investments in agriculture amounted to more than 170 billion rubles for the entire system of projects, which was more than 27 percent of the total volume of capital investments applied in the national economy.

The production of machinery and equipment and their delivery to kolkhozes and sovkhozes increased significantly. During the five-year period agriculture received 1.8 million tractors, more than 1.3 million trucks, around 540,000 grain combines and a large amount of other agricultural equipment, and around 400 million tons of mineral fertilizer.

A specialized branch was created for the production of machinery and equipment for livestock raising and feed production, which accelerated the industrialization of these important branches.

The power-worker ratio in agriculture rose 1.4-fold.

Land reclamation is an important factor in the achievement of consistently high yields and in the intensification of agricultural production. The program outlined at the May 1966 Plenum of the CPSU Central Committee is being consistently implemented. A large amount of reclamation and irrigation construction work has been performed in the nation. The total area of irrigated and drained land has reached almost 35 million hectares. A comprehensive program is being carried out to improve agriculture in the Nonchernozem Zone of the RSFSR. The concentration and specialization of agricultural production and agro-industrial integration have become more extensive and comprehensive.

We have passed yet another milestone marking important successes in the realization of the program aimed at thoroughly improving the workers' standard of living by increasing public production and making it more effective. The labor relay has passed on to the 11th Five-Year Plan.

In his speech at the October 1980 Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev gave a thorough, in-depth analysis of the results of national economic development under the 10th Five-Year Plan. The tenets and conclusions contained in his address are of fundamental importance for the continued building of communism's material and technological foundation, for the Soviet society's overall socioeconomic development. Overall, the results of the past five-year plan indicate that our nation has advanced in all areas of economic and social development.

The 11th Five-Year Plan is an important stage in the realization of the Soviet people's long-range tasks, in their creative activities. It is designed to insure the accomplishment of our increasingly far-reaching tasks and that we move ahead in all areas of communist development.

The main task of the 11th Five-Year Plan is one of insuring continued improvement of the Soviet people's welfare on the basis of stable, forward-moving development of the national economy, accelerated scientific and technological progress and the economy's transition onto the intensive path of development, more efficient use of the nation's production potential, all round conservation of all types of resources and the improvement of performance.

The Soviet people studied with great interest the CPSU Central Committee's plan for the 26th party congress, "Main Directions for the Economic and Social Development of the USSR for the Years 1981-1985 and for the Period Extending to 1990." This important party document embodies the continuity of the course worked out by the party on the basis of the party program, summarizes experience in the building of communism and takes into account the know-how of other socialist nations. The origins of this course go back to the time, 60 years ago, when the great Lenin formulated for the first time in history at the eighth All-Russian Congress of Soviets the basic concepts and trends for a single, national plan of economic development--the State Plan for the Electrification of Russia (GOELRO). Developed at V. I. Lenin's initiative, this plan laid the foundation for the scientifically based, comprehensive development of the economy.

The new program document reveals the far-reaching tasks involved in our creative work for the years ahead. It has undergone national discussion in the glorious Leninist tradition. This is confirmation of the fact that the party attaches paramount importance in its functioning to the interests of the people, consults them on all of the most important issues and brings together the know-how of the masses for the development of its policy.

Every line in this document is imbued with a desire to raise the nation's economic strength even higher and to insure the accomplishment of current social tasks on this basis.

During the years of the 11th Five-Year Plan we are faced with the tasks of bringing about progressive growth in the economy, perfecting the structure and improving the effectiveness of public production and improving product quality.

The plan calls for an increase of 18-20 percent in the national income. This kind of growth will make it possible to invest more funds in the development of industry and agriculture. Real incomes will increase by 16-18 percent, the average monthly earnings of blue- and white-collar workers will increase by 13-16 percent, public consumption funds will grow by 20 percent, and retail commodity turnover will increase by 22-25 percent.

Increasing the national income means constantly improving the effectiveness of public production, increasing labor productivity and achieving the maximum return from investments. There is special emphasis on the need to economize in the use of material resources--fuel, electric energy, metal and so forth. The less of these we use per unit of output, the greater will be the country's national income to be used for accumulation and consumption.

An important reserve for increasing the national income lies in increasing the output-capital ratio. An increase of only 1 kopeck per ruble invested in fixed productive capital, for example, would provide almost 5 billion rubles worth of additional output. More than one million "Belarus" tractors could be manufactured out of these means.

The main task for industrial workers in the new stage of creative work is that of satisfying more fully the nation's needs for means of production (machinery, equipment, instruments, fuel, energy, metal, chemical products and so forth), and the population's needs for consumer goods.

Industrial output will increase by 26-28 percent, including a growth of 26-28 percent for means of production and 27-29 percent for consumer goods. Production processes which save live labor will be adopted, and the amount of material and energy used per unit of output will drop sharply.

The most important task is that of thoroughly developing the agro-industrial, food production complex. This is an intricate production and economic system. It is made up of a number of branches of the national economy specializing in cropping and animal husbandry, the processing of the products for consumption and the production of means of production for agriculture and related branches. The complex can be divided into three main sections, according to the functions of the component branches.

The first section consists of branches and subbranches of industry supporting agriculture, the light, food and meat and dairy industries, and the system for procuring means of production.

The second section consists of the agricultural production itself. This includes the crop production and animal husbandry branches, the agro-chemical branch and agriculture's veterinary service.

The third section is made up of branches and production facilities handling the procurement, transportation, storage and processing of agricultural products.

We can see that the agro-industrial complex embraces a vast area of the economy. The nucleus of the complex is agriculture proper, of course. Most agricultural products cannot be reproduced in any other branches nor replaced by other types of products.

The buildup of agriculture's materials and equipment base and its gradual industrialization have accelerated the concentration and specialization of production and the creation of agro-industrial enterprises and associations. Conditions conducive to the integration of crop production and industry have been created in the production of a number of agricultural products. This is most graphically illustrated by the agro-industrial associations.

These are unified production and economic complexes in which the production of agricultural raw materials is organically combined with their processing, and with the sale of the finished product in some cases, on the basis of practical specialization and cooperation between agricultural enterprises and those of the processing industry.

Some examples of this are the Vil'yandiskiy and Pyarnuskiy Rayon agricultural associations in the Estonian SSR, the Talsinskiy and Valmiyerskiy Rayon associations in the Latvian SSR, and the Abashakiy Rayon association in the Georgian SSR. The results from the operations of these associations demonstrate their great effectiveness. Gross agricultural output increased by 59 percent during four years of the past five-year period in the Abashakiy Rayon association, for example. This included a 68.5 percent increase in the production of grain corn, a 3.6-fold increase in vegetable production and an increase of more than 40 percent in milk and meat production. Labor productivity rose by 42 percent.

As the number of agro-industrial enterprises and associations grows, conditions are developing for their organizational, economic and technological amalgamation into larger organizations--at the level of regions and subbranches of agriculture and industry.

As a result of the consistent implementation of the Party's agrarian policy, our agriculture has moved firmly onto the path of intensification. This fact is confirmed most of all by figures describing the growth of agricultural production volumes.

While giving due credit for the successes we have achieved, however, the CPSU Central Committee points out with the directness and demandingness inherent in our Party the fact that there are still many unrealized possibilities for the development of agriculture. Among other things, inadequate use is made of the resources allocated for agriculture.

The 11th Five-Year Plan provides for increasing gross agricultural output primarily by means of dynamic development and improved effectiveness in all its branches. We are to increase the average annual grain production to 238-243 million tons, the production of raw cotton to 9.2-9.3 million tons and sugar beet production to 100-103 million tons and to further increase the production, expand the assortment and improve the quality of potatoes, vegetables, fruits, berries and other

crops. The average annual agricultural output is to increase 12-14 percent over the figure for the last five-year period.

Thorough improvement of feed production and the creation of a reliable and balanced feed base in the nation has been defined as an urgent task. It is planned to increase average annual meat production to 17-17.5 million tons, milk production to 97-99 million tons and the production of eggs to at least 72 billion.

These tasks will be accomplished primarily by increasing the fertility of the soil, yields for grain, feed and other crops and livestock productivity, and through the extensive adoption of progressive industrial-type technologies.

Land reclamation will undergo further development. It is planned to increase deliveries of means of mechanization for cropping and animal husbandry and to achieve more efficient use of these.

The technical updating of agriculture will be continued by providing it with new equipment. During the five-year period kolkhozes and sovkhoses will receive 1,870,000 tractors, 1,430,000 trucks, 600,000 grain combines and a large quantity of other agricultural equipment. They will receive 3.9 percent more tractors, 11.5 percent more trucks and 11.1 percent more grain combines under the 11th Five-Year Plan than during the previous five-year period.

We will complete the overall mechanization of the production of sugar beets, raw cotton and fiber flax, the application of organic and mineral fertilizers and the application of plant protection agents. Mechanization in the production of vegetables, potatoes, fruits, feed and animal husbandry products will be raised to a considerably higher level.

The power-worker ratio in agricultural production will increase 1.4- to 1.5-fold.

Improving the use and care of agricultural equipment and the repair work and servicing is considered no less important, and because of this the buildup and specialization of the repair and servicing base will continue.

Greater responsibility is being assigned to farm leaders and specialists and to workers with scientific research establishments, Party, soviet and agricultural agencies for the adoption of scientifically based systems for performing agricultural operations and progressive systems for organizing the work.

The builders of tractors and agricultural machinery have been assigned large and important tasks. They must increase the production of such powerful tractors as the K-700, the T-150K and others, and develop an entire system of machines and implements to be used with them. Capacities will be developed and the manufacture of a series of highly productive machines will be set up for purposes of introducing industrial-type technologies for cropping operations.

The following is a good example. The four-meter and six-meter harvesters now provided by industry for the windrowing or direct combining of grain cannot be used in low stands, because they do not provide the thresher with an adequate

supply of material to keep it operating normally, and it wears out rapidly because of the extensive free-idle running. During the new five-year period it is therefore planned to develop a highly efficient grain combine with technical and economic indices measuring up to today's requirements, and wide-swath windrowers.

There will be an increase in the production of erosion-fighting equipment, combination cultivation and planting machines, machines and implements with actively operating elements. The manufacture of new equipment for preparing and applying solid and liquid mineral and organic fertilizer and chemical plant protection agents, and the manufacture of highly productive winnowing and winnowing-and-drying units and systems will be set up.

The production of systems of highly efficient machinery and equipment for animal husbandry, self-propelled feed harvesters, transport equipment with larger capacities for hauling the green mass, silage and haylage loaders will be expanded.

The prime tasks at the present time are those of further improving management and planning in the national economy, increasing the effectiveness of the economic system and its influence upon the functioning of the complex system of relationships within the overall national economic complex, raising production effectiveness and improving performance. The Party regards the improvement of management as an enormous reserve for accelerating our advancement.

Like all of the Soviet people, the rural workers responded with enthusiasm and excitement to the draft program for our nation's economic and social development. This is what F. Morgun, first secretary of the Poltavskaya Oblast Committee of the Ukrainian Communist Party, had to say, as an example:

"The task of improving soil fertility and crop yields and increasing the production of grain, feed and other products through the employment of zonal, scientifically based systems for conducting agriculture is a timely one. A creative approach to agricultural practices is what will help us to accomplish this task.

"Recently, agricultural scientists and specialists have been swinging more and more frequently toward no-till cropping. A production experiment has been under way in the Poltava region for six years now, and the specialists have become convinced of the advantages of no-till farming. Even under last year's difficult conditions, grain yields were more than 0.6 ton greater with this conservation cultivation. More than half of the cultivated land there is now being worked with the no-till system.

"It is our conviction," he continued, "that in the steppe, forest-and-steppe and to some degree in the forested areas of the European part of the USSR, we should be switching more actively from the traditional cultivation system of plowing with a moldboard to no-till cropping. Preliminary calculations show that this would make it possible to obtain tens of millions of tons of additional products annually, in grain equivalents, and to cut labor outlays considerably."

V. Kalashnikov, secretary of the Stavropol'skiy Kray committee of the CPSU, told about a very interesting organizational and economic experiment. An interfarm enterprise for the mechanization of agriculture has been created in Krasnogvardeyskiy Rayon. All of the machines and machinery of the kolkhozes and sovkhoses and Selkhoztekhnika's materials and equipment base have been combined under this enterprise. The new form of cooperation has proved to be a good one. It is estimated that if all of the farms in the kray were to achieve the same sort of results as those achieved in this rayon, it would be possible to cut the cost of mechanized operations by 48 million rubles annually, to save 20,000 tons of diesel fuel and eliminate the need for 6,200 tractors along with agricultural machinery totaling 49 million rubles in value. These possibilities were appraised and the same sort of associations were created in all rayons in the kray.

The creation of interfarm enterprises would make it possible during the new five-year period considerably to improve the use of equipment on kolkhozes and sovkhoses, to raise labor productivity and accelerate the accomplishment of tasks involved in the intensification of agricultural production.

N. Pereverzeva, well-known machine operator and a team leader on the "Put' Lenina" kolkhoz in Peschanokovskiy Rayon, Rostovskaya Oblast, proposes formulating the tasks involved in improving the use and conservation of the equipment in the following manner: "Continue to build up and specialize agriculture's repair and servicing base, update existing workshops, technical servicing stations and points and build new ones, outfit them with modern equipment and have an adequate number of enclosed areas and sheds for storing the machinery in the fall and winter."

"Farmers in the Orenburg area will make a worthy contribution to the resolution of the nation's grain problem," writes N. Vostrikov, secretary of the Orenburgskaya Oblast party committee. "Our plans place special stress upon the improvement of the structure of the cultivated areas, the accelerated adoption of progressive agricultural practices and the efficient use of fertilizer. Many things do not depend upon the crop raisers alone, however. For example, large trucks frequently have to wait in line at elevators because of the small handling capacity of the bucket elevators, which continue to be included in the plans for new elevators. Many harvesters are unsuitable for the vast steppe areas of the Southern Urals, Western Siberia, the Volga region and Kazakhstan. We believe that we should have modern, overall mechanization of all the operations involved in grain production, transportation, procurement and storage, and that we should create a single, reliable production chain--field-threshing floor-elevator."

V. Ovchinnikov, fitter-assembler at the "Gatchinsk' mash" plant, expresses concern about the reliability and the quality of machinery and equipment supplied to agriculture. He proposes that we improve the quality of plans, designs and technological schemes in order to make decisions on the development of new agricultural equipment, comprehensively and at the modern engineering level.

"In the 'development of the agro-industrial complex,'" opines A. Yartsev, chief quality inspector for the "Zarya kommunizma" kolkhoz in Rovenskaya Oblast, "we should place alongside the other urgent tasks that of introducing into production

on kolkhozes and sovkhoses the progressive, comprehensive system of production quality control, which has proved itself on a large number of farms, and creating on the kolkhozes and sovkhoses a functional quality service with soil agro-chemistry laboratories and laboratories for testing seeds, livestock feed and the nutritional properties of animal husbandry products in accordance with established standards.

While enthusiastically supporting the "Main Directions for the Economic and Social Development of the USSR for the Years 1981-1985 and for the Period Extending to 1990," A. Yarvesaar, machine operator on the "Sur'yu" sovkhos in the Estonian SSR's Pyarnuskiy Rayon, proposes that the following sentence be added to the section about improving the training of cadres in the common occupations for agriculture: "We must insure that they are retained on the kolkhozes and sovkhoses." He cites the fact that around 10,000 people are trained as machine operators each year in Estonia. The number of machine operators in agriculture is not growing, however, but is actually dropping. And concern for the training and retention of young machine operators, after all, is concern for the future of the kolkhozes and sovkhoses.

M. Ivanchik, machine operator on the Kolkhoz imeni Lenin in Starodubskiy Rayon, Bryanskaya Oblast, shares his thoughts on conservation and thrift. Competition for the conservation of diesel fuel and spare parts and for improved use of the equipment was initiated several years ago on their kolkhoz. Some individuals considered this to be a matter of secondary importance. Not all of the workers were able to make proper use of the resources entrusted to them: Now an engine would be left to idle for hours, now a worn part which could be restored to use would be written off as scrap metal. The conservation incentives established on the farm forced every individual to concern himself with the utilization of reserves. M. Ivanchik alone has personally saved 21.5 tons of fuel and spare parts worth 1,700 rubles.

In order to make the conservation campaign a mass movement the farm leaders, Party, trade union and Komsomol committees must be required to organize effective competition for economy and thrift.

The national discussion of this program document of the Party is clear evidence of the real democracy of social system. It is serious and constructive and is tied in with the specific tasks of the labor collectives. It has contributed to the widespread application of progressive know-how, the continued development of socialist competition and the elimination of shortcomings and deficiencies in the work, and has helped every worker to understand his part in the accomplishment of the tasks set by the Party.

The grand scope and objectives of the achievements ahead are inspiring the Soviet people and giving birth to a renewed outpouring creative effort. It is the duty of leaders and specialists of farms, agricultural agencies, enterprises and

organizations of Goskomsel'khoztekhnika [State Committee for the Supply of Production Equipment for Agriculture] to do everything possible to turn this great enthusiasm into specific action helping to continue increasing cropping animal husbandry output.

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TILLING AND CROPPING TECHNOLOGY

JOINT MINISTERIAL CONFERENCE EXAMINES LAND RECLAMATION OPERATIONS

Moscow SEL'SKAYA ZHIZN' in Russian 4 Apr 81 p 3

[Article by P. Shcherbakov: "For Increasing the Return From Reclaimed Lands"]

[Text] A joint conference of the boards of the USSR Ministry of Agriculture and the USSR Ministry of Land Reclamation and Water Resources.

Improvements in the return from irrigated and drained tracts of land and high quality land reclamation operations -- this represents one of the principal requirements imposed by the 26th party congress upon the agricultural and aquicultural organs. "Here we have in mind" emphasized Comrade L.I. Brezhnev, "the need for decisively raising the effectiveness of land utilization, especially reclaimed lands."

Improved lands are viewed as a chief reserve for the intensification of agricultural production. Occupying approximately 10 percent of the area of arable land and perennial plantings, last year the irrigated and drained tracts of land produced 34 percent of the gross output obtained from crop husbandry operations. The kolkhozes and sovkhoses are now obtaining all of their cotton and rice, 88 percent of their grain corn, three fourths of their vegetables and more than one fifth of their coarse and succulent feed from reclaimed lands.

During the years of the Tenth Five-Year Plan, the builder-reclamation specialists turned over to the country's kolkhozes and sovkhoses 3.8 million irrigated and 3.6 million drained hectares of land and 34 million hectares of watered pastures. The modernization of old adquicultural systems was carried out over large areas. The technical level of land reclamation operations was raised. More extensive use is being made of anti-filtration coverings for canals, closed tubular irrigators, automation and remote control for the issuing of water and highly productive sprinkling equipment.

The productivity of an irrigated hectare is now higher by a factor of 5.8 and a drained hectare -- higher by a factor of 1.5, than that obtained from non-reclaimed land. The area of renewed land accounted for 70 percent of the overall increase in gross farming output obtained on the average during the years of the Tenth Five-Year Plan.

Nevertheless, as mentioned during the joint conference of the USSR Ministry of Agriculture and the USSR Ministry of Land Reclamation and Water Resources, a level was achieved in the utilization of reclaimed lands which could not be considered adequate. Notwithstanding the high return realized from such lands in the Uzbek SSR, Tadzhik SSR, Ukrainian SSR, Moldavian SSR and certain krais and oblasts, there were also regions where the restored lands differed very little from non-irrigated lands in terms of their productive power. During the past five-year plan, this tended to hold back the production of a number of principal types of products.

What factors are hindering the effectiveness of use of these tracts and the rapid attainment of their planned cropping power? These were the key problems discussed by the speakers -- the Minister of Agriculture for the USSR V.K. Mesyats, the Minister of Land Reclamation and Water Resources for the USSR N.F. Vasil'yev and also those who participated in the debates.

A serious shortcoming in land reclamation construction work continues to be that of incompleteness. One particular situation mentioned in the speeches cannot be viewed as normal -- wherein the irrigation and drainage systems are placed in operation, while the construction of production facilities, housing and cultural domestic facilities lags behind. As a result, those farms which were provided with highly productive lands experience an acute shortage of man-power and do not realize the proper return from their improved areas. In the Volga region, the nonchernozem zone of the RSFSR and in the Far East, a considerable pause took place between the placing in operation of reclaimed lands and their agricultural development.

Yes, and at times the modern technical requirements are being violated in the land reclamation work itself. It happens that a farm obtains a tract of land for sprinkling and commences to develop the land, despite the fact that no collector-drainage network is as yet available. Nor can a high return be expected when the irrigated areas are placed in operation in accordance with a so-called temporary plan or when large tracts are artificially broken up into separate local tracts.

The planning and construction organizations have been censured quite fairly. The miscalculations of the Kuban'giprovdkhos planners alone can explain why 11,000 irrigable hectares were not supplied with irrigation moisture. Certain areas in Volgogradskaya, Saratovskaya and Tyumenskaya Oblasts were written off for the same reason.

A most important condition for the highly efficient use of reclaimed lands includes their reliable operation, modern repair and technical servicing. It is no secret that earlier the operational organizations of USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources] quite often considered their responsibility to begin and end with merely supplying water to the borders of farms. Today they are required to provide the kolkhozes and sovkhozes with assistance in carrying out the irrigation work and in operating the intra-farm networks. Indeed, the balance value of the irrigation and drainage systems has reached 30 billion rubles! Failure to provide skilled management and care for this complicated economy is simply inadmissible.

Life requires that each reclaimed hectare be utilized to the maximum degree. As mentioned in the report delivered by the Minister of Agriculture for the USSR V.K. Mesyats, a high productivity can be achieved from restored tracts of land

provided the structure of the area under crops is agrotechnically feasible and economically profitable. At the same time, a valuable crop such as grain corn has still not found a proper place on the irrigated lands. In the Georgian SSR and in Nikolayevskaya, Alma-Atinskaya and Dzhambulskaya Oblasts, the sowing of this crop under irrigation conditions has even been curtailed somewhat. Nor is grain corn very popular on farms in Kirghizia, Tadzhikistan or Turkmenia.

It was noted during the conference that during the past five-year plan considerable attention was given to expanding the sowings of perennial grasses under irrigation conditions. In 1980, they were grown on 22.5 percent of the irrigated land. Nevertheless, this is still not adequate for the mastering of scientifically sound crop rotation plans. Not enough alfalfa is being grown in the cotton growing republics. And indeed, in addition to being a wonderful high protein feed, it is also an excellent protector of cotton against wilt.

A substantial shortcoming in the efficient utilization of reclaimed land is the slow expansion of soybean sowings. At times this protein-rich crop is replaced in the crop rotation plans by low productivity annual grasses. Indeed, are the farms in the Georgian SSR acting correctly when they employ one third of their irrigated land for annual grasses? In the RSFSR and the Ukrainian SSR, annual grasses occupy 15-17 percent of the irrigated forage crop plantings.

A strong reserve for increasing output production -- secondary, intermediate and companion sowings on irrigated lands. The experience of leading farms reveals that such a combination of crops furnishes additionally 200-250 quintals of corn fodder per hectare, 150-220 quintals of leguminous grass mixtures and 10-15 quintals of buckwheat. In addition, the cultivation of secondary crops promotes a more complete and uniform utilization of man-power, irrigation water and equipment. It is assumed that greater attention is being given to this work in the warm republics of Azerbaijan, Uzbekistan and Kirgizia.

The speakers emphasized that the entire technological cycle must be observed in a very strict manner if a high return is to be realized from an irrigated hectare. No delays can be tolerated in the supplying of water or in applying fertilizers and tilling the crops during the proper periods. How is it possible to discuss a high return from an irrigated hectare for those farms where water is supplied only once or twice during the entire growing season. Last year, for example, water was supplied only once to an area in excess of 1 million hectares. Such incidents were observed taking place in particular on farms in the RSFSR, Azerbaijan and Kazakhstan.

In the self-critical statements made by the leaders of republic ministries of rural and water resources, mention was made of the specific measures developed for eliminating violations of the irrigation regimes, for achieving more productive use of the sprinkling equipment and organic and mineral fertilizers, for training cadres of sprinkling machine operators and for introducing scientific achievements and leading experience into operations.

The joint board developed specific measures aimed at improving the use of irrigated and drained lands and raising the quality of land reclamation operations.

During the course of the conference, a speech was delivered by member of the Politburo of the CC CPSU and secretary of the CC CPSU M.S. Gorbachev.

The following participated in the work of the boards: the Deputy Chairman of the USSR Council of Ministers Z.N. Nuriyev, head of the Agricultural Department of the CC CPSU V.A. Karlov and responsible workers of the CC CPSU, the USSR Council of Ministers, ministries and departments.

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PROBLEMS OF AGRICULTURAL CHEMISTRY DURING ELEVENTH FIVE-YEAR PLAN DISCUSSED

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 3, Mar 81 pp 7-16

[Article by V.G. Mineyev, corresponding member of VASKhNIL, All-Union Scientific-Research Institute of Fertilizers and Soil Science: "Problems of Agrochemistry in Light of the Tasks Confronting the Agricultural Scientists During the Eleventh Five-Year Plan"]

[Text] During the Tenth Five-Year Plan, a great forward step was taken in the development of agricultural production. For the very first time, the country's average annual yield of grain exceeded 200 million tons. Definite successes are being achieved in other areas of this important branch of the national economy. Our domestic farming possesses great potential opportunities, the realization of which will depend to a considerable degree upon further successful development of agricultural chemistry. These then are the problems being given special attention by the CC CPSU and the USSR Council of Ministers, as they proceed with implementation of Lenin's principles concerning the intensive development of farming throughout the country.

As early as 1915, V.I. Lenin wrote that the intensification of farming signifies a conversion over to higher systems of field crop husbandry, the increased use of artificial fertilizers, improvements in implements and machines and the increased use of these implements and machines^{*}; that is, a conversion over to the intensive use of agrochemical resources and agricultural equipment. These Leninist positions resounded with special force during the October (1980) Plenum of the CC CPSU and in the CC CPSU plan for the 26th CPSU Congress entitled "Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990," in which a discussion took place on the need for maintaining close contacts between agriculture and its servicing branches of industry. The General Secretary of the CC CPSU and Chairman of the Presidium of the USSR Supreme Soviet, Comrade L.I. Brezhnev, stated that special attention should be given to overcoming the intrabranh disproportions in the chemical industry. He underscored the need for increasing the production of raw materials in order to realize more complete utilization of the capabilities for producing fertilizers and also for increasing the deliveries of fertilizer to agriculture. This most important principle provides the foundation for further intensification of farming during the Eleventh Five-Year Plan, since fertilizers serve as the material basis for increasing yields and improving the quality of agricultural products.

^{*} V.I. Lenin. Complete Works, Vol. 27, p 181.

In conformity with the "Basic Directions for the Economic and Social Development of the USSR During the 1961-1985 Period and for the Period Up To 1990," the plans call for the production of mineral fertilizers to be raised to 36-37 million tons in 1985 and the deliveries to agriculture -- to 26.7 million tons, in a conversion for 100 percent nutrient content. The production of concentrated and complex fertilizers will be expanded and commencing in 1985 potassium fertilizers will be supplied to agriculture only in granulated and large-crystal form. And this requires that the agrochemical science and agrochemical service display greater responsibility for the correct and efficient utilization of fertilizers and also for reducing their losses during storage, transporting, and utilization. Special importance is attached to increasing the production and improving the quality of agricultural equipment. In focusing attention on the backward nature of agricultural machine building, L.I. Brezhnev stated that a row-crop tractor and a grain combine must be created and placed in production during the Eleventh Five-Year Plan and that these machines, in terms of their characteristics, must meet the high modern requirements. This will make it possible to take a large step forward in the work of raising the efficiency of agriculture.

All of these factors have a direct bearing on the agricultural equipment used during the transporting, storehouse processing and application of fertilizers. By no means have solutions as yet been found for those problems concerned with the quantity and quality of those machines associated with the use of chemical processes in farming. In implementing improvements in the various agricultural technological processes and machines, an important role is played by the respective branches of science. Science and equipment must be developed on an interrelated basis. This is the essence of scientific-technical progress. It can be stated that the intensity of scientific development is determined to a considerable degree by the technical level for the development of society. At the same time, the technical equipping of the branch is dependent upon the status and level of development of science.

In defining the basic directions for agrochemical studies during the Eleventh Five-Year Plan and in the more distant future, mention must necessarily be made of a number of important scientific developments of great national economic significance and, at the same time, we must also discuss certain unsolved problems in the field of agricultural chemistry.

"The 'basic directions' stated L.I. Brezhnev during the October (1980) Plenum of the CC CPSU, 'must provide for a complex of measures which will make it possible to overcome the backwardness in chemistry.' He emphasized that he had in mind a complex of decisive measures. Today there can be no efficient economy if modern chemistry is not available.

An example of this would be a large interbranch scientific work -- a chart of a geological-economic evaluation of agrochemical raw materials and explanatory notes for it. These materials were obtained as a result of joint studies by scientists representing different specialties and they were published under the editorship of A.S. Zverev and V.G. Mineyev. The chart provides information on the volume of mineral fertilizer consumption at the present time, the fertilizer requirements of agriculture for the future and the status of the raw material resources in the earth -- proven and forecast reserves, the possibility and prospects for increasing them, quantitative and qualitative conformity to the requirements of the consumers

throughout the country and in the various regions; the status and long-range extraction, enrichment and processing of agrochemical raw materials. These studies of the system: resources - extraction - enrichment - processing of mineral raw materials - consumption of the products of processing - are solving an important and complex national economic problem.

All of the elements of the geological-economic evaluation of the agrochemical raw materials are clearly shown on the chart and they are in fact its special content. The chart and the explanatory notes for it provide information on the status and prospects for developing the mineral-industrial complex and also on the growth in the requirements for its principal product -- mineral fertilizer. Moreover, they can serve as a reliable basis for planning work associated with the interrelated development of all branches of the national economy, included in the agrochemical mineral-industrial complex. This large-scale interdepartmental scientific work was carried out in conformity with the tasks associated with development of the industry of mineral fertilizers and chemical agents for the protection of plants.

In addition and in conformity with the program of agrochemical studies for the future, the collectives of scientists at VIUA [All-Union Scientific Research Institute of Fertilizers and Soil Science] imeni D.N. Pryanishnikov, the USSR Ministry of Agriculture, NIUIF [Scientific Research Institute of Fertilizers, Insecticides and Fungicides] imeni Ya.V. Samoylov and the USSR Ministry of the Chemical Industry developed the mineral fertilizer requirements for USSR agriculture for 1990 and also the optimum assortment and quality for such fertilizer. Computations reveal that 5.7 kilograms of grain and approximately 3 kilograms of raw cotton were obtained on the average during the 1971-1978 period per kilogram of nutrients, that is, in conformity with the level of existing norms. Moreover, the annual economic effect realized from the use of mineral fertilizers in agriculture amounted to an average of approximately 5 billion rubles during the 1976-1978 period and the fertilizer expenses were repaid by more than twofold in terms of the value of the additional product obtained.

Distinct from previous works, carried out during the period devoted to the formation of the modern and large-scale domestic mineral fertilizer industry and to the development of a system for supplying agriculture with mineral fertilizers, the present work is based upon accurate production volumes for the agricultural products, defined in the decrees handed down by the party and government and also in the works of the planning organs.

The assortment of mineral fertilizers, the validation of their quality and the level of development for the logistical base for the use of chemical processes were developed taking into account the modern achievements of the agrochemical science, scientific-technical progress in the production sphere, the use of mineral fertilizers and the peculiarities associated with supplying the country with raw materials for the production of fertilizers. The work carried out was based upon a scientifically sound system for the storage and use of fertilizers, a system which takes into account the optimum norms, schedules and technology for applying fertilizers. Consideration was also given to the need for supplying agriculture with complex fertilizers based upon the production of complex forms and the preparation of dry and liquid mineral fertilizer mixtures.

In carrying out the present work, use was made of the principal methodological positions of promising works by VIUA, VASKhNIL [All-Union Academy of Agricultural Sciences (in honor of V.I. Lenin)] and the USSR MSKh [Ministry of Agriculture] and also the results of agrochemical analysis of soils and experiments carried out with fertilizers, using the data of scientific institutes within the system of the geographic network of experiments by VIUA and the USSR Agrochemical Service.

The complex approach -- represents a most important principle in the development and working out, in the national economy, of large-scale national economic problems. For example, the geological-economic chart of agrochemical resources makes it possible not only to determine the country's requirements for mineral fertilizers up until the end of the century and ensure the availability of the required agrochemical raw materials, but in addition it outlines the prospects for the construction of new industrial chemical enterprises, the development of various types of transport communications, housing areas having complexes of socio-cultural installations and so forth.

The long-range planning of the country's mineral fertilizer requirements is closely associated with the development of normative materials. VIUA, jointly with TsINAO [Central Institute of Agrotechnical Services] and NIIPiN [Scientific Research Institute of Planning and Standards] and other scientific institutes throughout the country, presented USSR Gosplan with normatives for mineral fertilizer expenditures for obtaining the planned yields for different agricultural crops and they defined the normative expenditures for organic fertilizers and lime materials, required for improving the reaction of the soil medium to the optimum pH level and the expenditure norms for transporting, storage and the application of the fertilizers to the soil. These materials provide a fine scientific basis for planning the mineral fertilizer requirements of the country, individual republics and zones and their proper distribution, in the interest of obtaining the planned harvest and the gross yield of crop husbandry products.

These normative materials will be constantly taken into account and improved based upon new experimental data, obtained by the country's scientific-research institutes under various soil-climatic conditions, as called for in the program for agrochemical studies during the Eleventh Five-Year Plan.

An important and final stage in the agrochemical studies is that of developing scientifically sound recommendations for the efficient utilization of the fertilizers. VIUA, jointly with the republic and zonal scientific research institutes and based upon the experimental data obtained from the geographic network of experiments, has prepared such recommendations for zones and republics during the Eleventh Five-Year Plan. Similar recommendations were published during the Tenth Five-Year Plan. The new experimental material is making it possible to improve them, such that under specific soil-climatic conditions and in a complex with other agrotechnical methods, a greater return will be realized from the fertilizers. Thus a most important task of the agrochemical science during the Eleventh Five-Year Plan is that of developing highly efficient systems for the use of organic and mineral fertilizers. This will serve to ensure that the planned yields will be obtained for the agricultural crops, that the products will be of high quality, that the soil fertility will be improved in a systematic manner and that man's natural environment will be preserved and improved.

under conditions involving further specialization and concentration of agricultural production and also development of the grain economy, a requirement will exist for improving the scientific principles and developing specific systems for employing fertilizers in crop rotation plans for all of the principal soil-climatic zones of the country, taking into account the geographic regularities of the action of fertilizers and the varietal characteristics of the agricultural crops. In this regard, the development of methods for ensuring the highly efficient utilization of fertilizers on irrigated and drained lands and, on this basis, obtaining guaranteed and planned yields for the principal agricultural crops, regardless of changes in the weather conditions, is considered to be a very important task of agricultural chemistry.

In further studies concerned with establishing the geographic regularities of the effect of fertilizers, the plans call for a more thorough study of the effectiveness of the fertilizer types and dosages and the periods and methods employed for applying them, in connection with the natural and agrotechnical conditions. A study of the responsiveness of intensive type varieties to fertilizers is also deserving of great attention. It can be stated with confidence that a considerable increase in the production of crop husbandry products will become possible in the future, as a result of the correct combination of scientifically sound utilization of all types of fertilizers and the introduction on the country's fields of new and highly productive varieties of agricultural crops.

A study of the more intensive utilization of fertilizers must be carried out taking into account the direction of changes in the agrochemical indicators and in the biochemical properties of soils. The task consists of improving the productivity of farming and striving to improve constantly the fertility of soils and their chemical, physical and mechanical properties. This requires a considerable expansion of the agrochemical and soil studies of the nutrient balance and humus in the soil, their transformation in the soil taking into account its properties and the weather conditions, the type of fertilizer employed and the complex of agrotechnical and land reclamation methods. Improvements must be realized in the study method, using ^{15}N , ^{32}P and ^{40}K . Special interest is being displayed in a study of the balance and dynamics of transforming the nutrients and humus in the soil, during lysimetric and extended fixed experiments with fertilizers, into the various soil-climatic conditions of the country.

Our domestic farming differs substantially from west-European farming, since it is conducted under more severe and extreme conditions: frequent droughts in the steppe and southern forest-steppe regions, an abundance of moisture in the northern regions, considerable areas of arable land on soils having high acidity and alkalinity levels. Approximately one half of the agricultural lands contain only weak amounts of the mobile forms of phosphorus, which determines to a considerable degree the cropping power of the crops being cultivated. In addition, the growing season is short in many farming regions, the total amount of active temperatures during the growing season is low and permafrost prevails on a considerable area of agricultural land in eastern Siberia. These factors serve to explain the peculiarities associated with the conduct of agricultural operations in our country. Thus the deficiency of phosphorus in the soil, the dry conditions, the low temperatures and the brief growing season require extensive use of phosphorus in the system of fertilization. In view of the acidity and alkalinity levels of the soil,

a complex approach is required for taming it -- the development of a fertilization system to be employed in combination with effective methods for chemical land reclamation, particularly that of applying lime and gypsum to acid soils.

In regions of excessive moisture, a fertilization system is required which is aimed at raising the coefficient of use of nutrients by the agricultural crops and reducing their losses to the environment, as a result of ground water migration and surface run-off into rivers, lakes and other water sources. And this is dependent to a considerable degree upon the fertilizer forms and the periods and methods used for applying them.

In many western European countries, the system of fertilization in a crop rotation plan consists of a periodic application for 3-4 years (in reserve) of phosphorus fertilizers and quite often on soils of a heavy mechanical composition -- potassium fertilizers -- and an annual split application of nitrogen during the growth process for the plants, by phases of its intensive consumption. This is unacceptable for our farming, mainly owing to the phosphorus deficit.

Many European countries apply phosphorus fertilizers in norms which exceed the withdrawal of it by agricultural crops by one and a half to two times and often with the soil having a high content of mobile phosphorus. In this manner, a background of high soil fertility is created for the more remote future. For example, experiments are being carried out at the Rotamsted Experimental Station in Great Britain, where the soil, for a number of decades, was supplied with ample amounts of phosphorus. During the past few decades, extremely high yields have been obtained here, with only nitrogen-potassium mineral fertilizers being applied.

Both foreign and domestic experience reveal that on soils having a low content of mobile phosphorus the norm for applying it must be no less than twice the amount withdrawn by the agricultural crops. If the soil contains an average amount of mobile phosphorus, the norm for applying it must equal roughly one and a half times the amount withdrawn in the crops of cultivated plants. If there is a high content of this element in the soil, it is sufficient to add a phosphorus fertilizer norm which would compensate for the amount withdrawn by the agricultural crops. It is important that this be done taking into account the systematic growth in yields and improvements in soil fertility. The fertilizer norms must be defined more precisely based upon a series of field experiments. In view of the shortage in fertilizers, especially phosphorus, studies should ideally be continued with regard to the development of more efficient methods for utilizing the phosphorus mineral fertilizers (local, pre-sowing and during sowing applications), and also the optimum ratio between nitrogen and phosphorus and the correct distribution of phosphorus mineral fertilizers in oblasts and rayons and at kolkhozes and sovkhozes, taking into account the mobile phosphorus content in the soil.

During the October (1930) Plenum of the CC CPSU, L.I. Brezhnev, in focusing attention on existing shortcomings and difficulties with regard to supplying the cities and industrial centers with such food products as meat and milk, stated: "Thus it is important in the future to provide agriculture with large-scale capital investments and material resources. At the same time, we must raise our exactingness sharply so as to ensure that the funds, mineral fertilizers and equipment so allocated are used at the kolkhozes and sovkhozes in a judicious and thrifty manner and produce a maximum return."

Importance is also attached to raising the effectiveness of the agrochemical studies. And this is determined by the qualifications of the scientific personnel, by the logistical and scientific base, by the use of new methods for a modern and highly productive analytical technique and also by the correct organization of scientific studies.

A great deal has been accomplished in studying the effectiveness of fertilizers from a zonal standpoint, owing mainly to work carried out by the geographic network of experiments with fertilizers. Information has been obtained on the effectiveness of various types of fertilizers and their combinations, on the optimum fertilizer dosages for individual crops and for systematic applications in a crop rotation plan, on the effect of fertilizers on the nutrient balance in farming, on the quality of crop production products and so forth. These studies are being carried out taking into account the specific soil-climatic conditions and this is making it possible to improve the practical recommendations for the most efficient utilization of fertilizers. Attention must necessarily be focused on the tendency that has appeared in recent years towards underestimating the value of theoretical studies in agrochemistry. Meanwhile, science must define the development of a particular branch and the principal trends in its development and it must also foresee the appearance of possible positive and negative phenomena. The studies in this regard must be expanded considerably. An overall approach and the development of special purpose programs of study are required. For example, models of high fertility soil have still not been developed from a zonal standpoint, nor have studies been undertaken on the peculiarities of plant nourishment and the use of fertilizers under extreme conditions (during a prolonged drought, excessive moisture or under conditions involving low or raised temperatures), on plant nourishment during the intensive use of raised dosages of mineral fertilizers or on problems concerned with the optimization of plant nourishment. Very little attention has been given to studying the effectiveness of mineral fertilizers depending upon the degree of taming of the soils, the level of humus content in the soil and other factors.

Theoretical studies on the mineral nourishment of plants, in connection with the realization of their potential productivity and taking into account the quantity and quality of the crop production products, are considered to be extremely vital. Studies carried out at VIUA have shown that spring wheat, under controlled conditions (phytotrons) is capable of furnishing a yield on the order of 2.5-3 kilograms of grain per square meter. And this is far from being a maximum limit. Further research on the theoretical principles of mineral nourishment must be directed towards studying the effect of mineral fertilizers, on plant accumulation of carbon dioxide during photosynthesis, on the physiological processes of metabolism and the formation of quality in agricultural products, on the mechanism for the flow of nutrients into plants and on fermentation activity, particularly in the root system of plants.

Interest is also being displayed in expanding the study of the effect of the plant itself and the rhizosphere of microflora on the accessibility of nutrients to the plants. Greater attention must be given in agrochemical studies to the growth of biological nitrogen in farming.

The need for carrying out thorough theoretical studies on the formation of the amount and quality of an agricultural crop yield has been revealed in particular during the past few years (1979 and 1980). The extreme conditions experienced

during these years resulted in a large shortfall in crop husbandry products, especially grain, in a number of farming regions. The absence of theoretical studies being carried out in the zonal and all-union institutes on the peculiarities of plant nourishment under extreme conditions, on the metabolism of elements and compounds in plants and on the formation of grain and other questions precludes the possibility of uncovering the reasons for the shortfalls in crops and, it follows, of undertaking appropriate measures for revealing them in the future. Science must be aware of and propose specific measures for substantially weakening the effect of negative factors, and particularly unfavorable weather conditions, on plant growth and development and on product yields and quality. The complex studies must include the combining of research, theoretical and applied works and the solving of tasks both for today and for the more remote future.

More attention must be given to those problems associated with the possible negative effect of high dosages of mineral fertilizers on the biosphere and on the quality of crop husbandry products. Studies on the synthesis of new forms of fertilizers with a raised coefficient of use of nutrients by plants and their reduced losses in the environment are not keeping pace with the farming requirements. This is especially important in light of the fact that our agriculture will continue to experience a shortage of mineral fertilizers for an extended period of time (in the required volume and assortment).

An overall special purpose program of studies calls for the participation in its implementation of specialists from allied branches: agricultural chemists, soil scientists, physiologists, biochemists, engineers and others. This is required in particular during the development of such complicated problems as the creation of models of high fertility soils from a zonal standpoint, steppe farming systems, soil protective farming under conditions involving water or wind erosion and mountain farming.

The development of complex problems is dependent to a considerable degree upon the skills possessed by the scientific personnel, the availability of the proper logistical and scientific base and highly productive and approved methods for conducting studies and so forth. Hence, they can be solved at those zonal or all-union scientific-research institutes which have the conditions available for carrying out such studies. For example, in the unique and proven geographic network of experiments, it is possible to establish base institutes and task them with coordinating the work of solving large-scale scientific problems, including those associated with soil fertility, after providing them with the necessary scientific equipment and instruments and well as highly skilled personnel. The farming systems are zonal in nature and should be solved from a zonal standpoint. The base institutes must be in the large farming zones: nonchernozem zone of the RSFSR; western region of the nonchernozem zone of the USSR, north Caucasus, the Volga region, Central Chernozem Zone, the Ukraine and Moldavia, Trans-Caucasus, Central Asian Region, the Urals, western Siberia, eastern Siberia, the Far East, Kazakhstan and Kirgizia. At the present time, these requirements are already being met by such institutes as the Institute of Agriculture for the Central Regions of the Nonchernozem Zone of the RSFSR, the Krasnodar Scientific Research Institute of Agriculture, the Ukrainian Scientific Research Institute of Soil Science and Agrochemistry, the Belorussian Scientific Research Institute of Farming and the Use of Chemical Processes and others.

The work must be carried out on the basis of uniform methodological guidance being provided by the All-Union Scientific Research Institute of Fertilizers and Agricultural Soil Science imeni D.N. Pryanishnikov. The base institutes must also become large-scale analytic centers having highly productive analytic scientific equipment at their disposal. The Engineering-Research Department of Applied Agrochemistry, which functions within VIUA, could serve as a prototype of such an analytic center.

All of the experimental stations and other scientific institutes in the zone must participate actively in carrying out the complex sections of the program of studies under the direct management of the base zonal institute.

Improvements in the efficiency of scientific studies is inseparably associated with improvements in the methods employed in carrying out analytic work. A great amount of attention has been given to these problems at VIUA in recent years. The efficiency of scientific studies at the institute has increased considerably as a result of the development and introduction of a method for the multi-element neutron-activation analysis of plants. This highly productive arrangement serves many scientific institutes of the geographic network. A great amount of interest is being displayed in the roentgen-fluorescent method of soil analysis for macro and micro-element content. Methods have also been developed for determining the carbon and nitrogen in the soil and extensive use is being made of the chromatographic method for determining the amino acid structure of proteins. A license was sold to the French-American firm Kodevintek for a mathematical program for conducting neutron-activation analysis and for a method for determining the carbon content in soil -- to the West German firm Khereus. In the future, a most important sector of agrochemistry will be that of developing a methodology for experimental studies based upon high-information experiments, the creation of complex automated information-computer systems for summarizing the data of field experiments and agrochemical laboratory analyses and the issuing of recommendations to agricultural production on the efficient use of fertilizers and other chemical agents.

The introduction into the practice of scientific-research institutes of highly productive methods for analyzing soils, plants and fertilizers -- is an important task of agricultural chemistry, for it determines the level of the studies themselves and the effectiveness of science.

The deficit in mineral fertilizers requires improvements in the principles underlying their correct distribution throughout the country by natural-economic regions, with their effectiveness being taken into account. For example, many technical crops such as cotton, beets, spinning-flax and others are adequately supplied with fertilizers. In a number of zones, potatoes and vegetables are fertilized in a very poor manner. The chief problem of the times is that of increasing the production of grain and creating the feed base for animal husbandry. In the CC CPSU plan for the 26th CPSU Congress entitled "Basic Directions for the Economic and Social Development of the USSR During the 1961-1965 Period and for the Period Up To 1990," it is mentioned that agriculture must rely upon solutions being found for those tasks concerned with increasing the production of grain and feed. The plans call for the average annual production of grain to be raised to 238-243 million tons, including to 14-15 million tons of pulse crops. In this regard, it is considered advisable to allocate fertilizers for the winter grain crops in the norms recommended by the scientific-research institutes.

Since winter crops are for all practical purposes semi-irrigated, in view of the fact that they utilize autumn, winter and spring precipitation, the effectiveness of fertilizers on their plantings is higher than on spring grain crop plantings and the remuneration from mineral fertilizers is as a rule greater. The same can be said with regard to spring wheat grown following clean fallow. The best regime of soil moisture following fallow leads to a noticeable increase in the effectiveness and return from the mineral fertilizers employed. Thus special importance is attached to allocating mineral fertilizers for these plantings of spring wheat, especially in the Volga region, the Urals, Kazakhstan and Siberia.

Greater attention must be given to searching for and developing methods for the more effective utilization of the different types of organic fertilizers and other local fertilization and land reclamative resources (phosphorites, defecate, limestone, dolomites, gypsum-containing materials and others). The effectiveness of these local materials must be studied thoroughly, taking into account the specific soil-climatic conditions and agrotechnical methods. The agrochemical science, jointly with the agrochemical service should have prepared recommendations for their effective use. In particular, caution should be exercised in making use of the waste products of the various branches of industry for fertilization purposes. Strict agrochemical and sanitary control must be exercised, since many waste products, in addition to the biogenic elements required for plant nourishment, contain toxic compounds which contaminate the soil and adversely affect the productivity of the plants and the quality of the crop husbandry products.

The task of the agricultural chemists, soil scientists and workers attached to the sanitary-hygienic service consists of raising the fertility of the soil and maintaining it in a clean state, since this soil will continue to be the principal source of material welfare for many generations into the future.

The effectiveness of agrochemical studies, similar to other branches of the agricultural science, is determined by the practical results obtained and by the introduction of developed methods and technologies into the practice of farming. The CPSU and the Soviet State are devoting a great amount of attention to strengthening the link between science and production. All of the conditions have been created in our country for accelerating the development of efficient technologies for employing fertilizers and for introducing them into farming practice. The State Agrochemical Service and the All-Union Production Association Soyuzsel'khozkhimiya have been created, new ministries have been organized for the production of mineral fertilizers and a geographic network of scientific institutes and VUZ's is in operation throughout the country. This latter network has justified its existence in connection with the preparation of materials for the planning organs and also recommendations on the efficient use of fertilizers at kolkhozes and sovkhoses under various soil-climatic conditions.

At the present time, importance is being attached to ensuring that the work is organized in a manner such that all elements in the technological chain is carried out in an efficient and harmonious manner: from the production of the fertilizers to their consumption on the farms. The scientific-research institutes and VUZ's in the geographic network and also all subunits of the agrochemical service must operate on the basis of a common complex program and one which calls for theoretical studies and the development of efficient technologies for the use of fertilizers directly at the kolkhozes and sovkhoses.

All of the agrochemical tasks must be subordinate to the one goal -- raising the productivity of domestic farming. The scientists of our country, together with all of our Soviet people, greeted the 26th CPSU Congress with a great amount of enthusiasm and they are fully resolved to devote all of their knowledge towards successfully implementing its historic decisions.

Conclusions

Further development of the theoretical positions and practical recommendations of agronomical chemistry represent an important condition for carrying out the potential opportunities of domestic farming.

Modern agricultural chemistry embraces a broad spectrum of problems: the effect of fertilizers on soil fertility, balance and metabolism of nutrients, productivity of agricultural crops, quality of crop husbandry products, profitability of kolkhozes and sovkhoses, improvements in the environment and so forth. This requires the use of a complex approach for solving the agrochemical problems and those of other allied specialties by the scientist-agrochemists and agrobiologists.

Theoretical studies on the mineral nutrition of plants and achieving their potential productivity, taking into account the quality and quantity of products, are acquiring greater importance.

The effectiveness of agrochemical studies is determined to a considerable degree by the qualifications of the scientific personnel, by the logistical and scientific base, by the use of new and highly productive methods and modern analytic techniques and also by the correct organization of scientific studies.

All of the conditions have been created in our country for raising the results of agrochemical studies and for developing effective technologies for the use of fertilizers and for introducing them into agricultural production. Importance is attached to ensuring that the solutions for all agrochemical tasks are directed towards achieving the common goal -- raising the productivity of domestic farming.

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Summary by V.G. Mineyev. The problems of agricultural chemistry in light of the tasks confronting the agricultural scientists during the Eleventh Five-Year Plan. -- VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI, Moscow, 1981, No 3(294). ISSN 0376-0073.

The tasks confronting agricultural chemistry are described in light of the tasks planned by the agricultural scientists for the Eleventh Five-Year Plan. The further development of the fundamental tenets and applied recommendations of agrochemistry is viewed as an important task associated with realizing the potential possibilities of rational agriculture.

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TILLING AND CROPPING TECHNOLOGY

REVIEW OF CROP SITUATION AS OF EARLY FEBRUARY, ADVICE ON HOW TO PROCEED

Kiev SIL'S'KI VISTI in Ukrainian 15 Feb 81 p 1

[Article by Ministry of Agriculture, Southern Section VASKhNIL: "Winter Crop Care"]

[Text] Last fall farmers put a lot of effort into providing a firm foundation for the first year harvest of the new five-year plan. Regardless of the not too favorable weather conditions during the summer-fall period the farms fulfilled the winter crop sowing plan fully.

Overcast, rainy weather in the fall delayed the first phase processes in plant strengthening and therefore in their sugar accumulation, the content of which determines the degree of winter crop frost hardiness. A warming trend in the second half of December caused a two degree lowering in cold resistance compared to the first half of the month. Yet, plant cold resistance forms through their interaction with outside conditions and can be renewed under the influence of gradual (and not sudden) cooling.

In sudden, post-thaw marked cooling crops unprotected by a snow layer can be damaged considerably, especially those which grew more than others. A succession of thaws and sudden cooling also leads to the formation of a ground-in ice crust, which may be seen most frequently in the south-eastern part of the Forest-Steppe and in the Polissya area. During February, when low temperatures occur frequently, a danger of freezing exists also. A harmful factor in winter crop wintering is plant tillering node prominence which happens mostly in early spring when frosty nights are followed by warm days, and because of thawing water stagnation which causes drenching.

What should the farmers do to save winter crops from the actions of unfavorable conditions in external environment? First of all, control of plant vitality should be strengthened on each farm, along with adherence to determined dates for monolith selection. If needed accelerated water or sugar methods should be used. Only thorough and timely determination of the state of winter crops, extent and type of crop damage will provide an opportunity to correctly develop care measures for them.

Among these measures spring top dressing is of great importance. Especially during the vegetation renewal period winter crops really need nitrogen. Lack of this element in the soil weakens the formation of new shoots, rootlets and high-quality

reproductive organs. It should be noted that this year with sufficient moisture reserves in the soil spring top dressing will be effective in all zones of the republic.

Specialists should consider the extent of nutrient washing out into the deep soil layers because of precipitation in the fall-winter period. According to data from the Ukrainian Scientific Research Institute of Soil Science and Agrochemistry nitrogen content in the thirty cm soil layer decreased as a result of washing out processes by 10-25 kg per hectare. In addition, increased nutrient losses for plant growth may be observed especially in the Steppe (because of prolonged vegetation). In the south of the republic, in areas where insufficient or no fertilizer was applied, leaves turned yellow. In these crops, according to data from the Ukrainian Scientific Research Institute of Irrigated Agriculture, nitrate content in the soil plowing layer last fall amounted to 0.69-1.75 mg per 100 grams soil, or 2.5-4 times less than normal.

Therefore, almost all crops (with the exception of those which were very well developed) allocated after better predecessors and sufficiently fertilized should be top dressed as early as possible over the thawed-frozen soil with nitrogen fertilizer, 30-40 kg activated substance per hectare or with full mineral fertilizer application. Fertilizer doses should be increased over thinned and poorly developed crops. Over crops which were not fertilized or top dressed (in the fall-winter period), allocated after corn for silage and after stubble predecessors, nitrogen fertilizer doses in the spring may be increased to 50-60 kg per hectare. It is advisable to top dress these areas twice -- early in the spring and at the start of the plant stem elongation period.

Fertilizer types and doses should be determined according to plant condition, soil fertility, predecessor, fertilizer applied, also considering the recommendations of the agrochemical laboratory and scientific organizations.

Of course, early spring winter crop top dressing is accomplished with the help of aviation. Thoroughly pulverized mineral fertilizers are distributed evenly over the field.

Tillered crops of winter wheat should be top dressed prior to plant stem elongation with grain disc drills by the root method. This method provides for a harvest increase of two to three quintals of grain per hectare. These areas need not be harrowed again.

In the first year of the 11th Five-Year Plan the republic's kolkhozes and sov-khozes took it upon themselves to realize to the state 2.4 million tons of strong and valuable wheat. Areas set aside for this purpose should be tended especially carefully, providing scientifically grounded plant nourishment. This is achieved, in addition to appropriate fall soil fertilizer treatment, by essential early-spring crop top dressing and carbamide solution application to the leaf surface during the heading stage and at the beginning of the grain milky stage.

Winter crop harrowing (those which were not top dressed by the root method) should be done when the soil breaks up well at the depth of harrow working part passage with consideration of crop condition in each field or area. If soil condition allows,

poorly developed and damaged crops may be harrowed only after their complete sprouting and good rooting. Over very flooded soils, where harrowing does not achieve essential soil surface loosening and weed destruction, this measure is also useless.

During plant tillering node prominence winter crops must be packed when the soil does not smear and does not stick to the ridge-roller.

The conditions last fall, warm weather during the first half of winter, especially in the south, promoted weed growth over winter crops. Therefore, it is essential to prepare the necessary amount of herbicides in time according to weed types, and also the appropriate technology for their application. The best time for working the crops with the 2.4 D herbicides is during the tillering stage, when the daily air temperature reaches 10-12 degrees warmth. It must be remembered that winter crop working with herbicides after the tillering stage may affect their further development negatively. Recommended norms for preparation use must be strictly adhered to.

In the spring period winter crops especially those allocated after stubble predecessors on farms of Dnepropetrovskaya, Zaporozhskaya, Donetskaya, Krymskaya, Nikolaevskaya, Kirovogradskaya, Odesskaya, Khersonskaya and Kharkovskaya Oblasts will be threatened by the grain weevil. To save the crops, infested areas must be determined and careful observation of pest development must be set up. With the presence of two or more weevil larvae per square meter, infested areas must be worked with poison chemicals.

In the Steppe and southern Forest-Steppe rayons crops may need to be treated against chinch bugs. In the central and western oblasts of the republic an increase in mouse-like rodents may be noted. In the kolkhozes and sovkhozes of Vinnitskaya, Zhitomirskaya, Kievskaya, Odeskaya, Cherkasskaya and other oblasts poisoned grain traps are used (phosphide zinc or Gliftor) with an application norm of 2-4 kg per hectare, bacteriodencide and ammonia water.

One of the winter crop care measures is crop treatment with the TUR preparation against lodging. It should be applied during sufficient soil moistening, good plant development and when they are assured of nitrogen nourishment.

All measures for winter crop care should be conducted creatively with consideration of crop condition on each field, time of vegetation renewal and soil moistening.

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TILLING AND CROPPING TECHNOLOGY

WEATHER AND CROP COMMENTARY

Kiev SIL'S'KI VISTI in Ukrainian 1 Mar 81 p 4

[Article by M. Tsubenko, head of Agrometeorology Department, Ukrainian Republican Hydrometeorology and Natural Environment Control Administration: "Melted Snow for the Field"]

[Text] More than a third of the sowing areas in our republic are located in the insufficient moistening zone -- in its southern and south-eastern parts. These are Steppe rayons. Therefore, soil moisture reserves, especially in the spring, have a decisive effect on obtaining high yields. Moisture accumulation and preservation in the fields and clearing the soil of weeds, especially prior to sowing, are the machine operators' most important tasks.

This year because of unstable winter weather, frequent thaws, little ground freezing and a marked frequency in precipitation, productive moisture reserves in the meter layer of soil in most rayons are already close to the maximal amount possible. They are now between 160-200 mm and in some places even more. They are somewhat lower in the Steppe -- 120-160 mm, but are also superceding the average over many years.

In the fall-winter period the surface moisture combined with the moisture in the deeper layers. This provides excellent perspectives for a good harvest.

As always, spring field work will be started by the farmers' faithful helper, agricultural aviation, top dressing winter crops. This spring this particular agricultural measure is especially important since the soil is moistened better than ever and winter crop and sown perennial grass wintering is generally satisfactory. Experience shows that in these conditions early top dressing provides an important harvest increase.

All should be ready for this work even in rayons where there is still snow now whose covering is uneven and the compactness which formed in February is insignificant. This type of snow in the days noted is easily "eaten up" by fog and "licked off" by southern winds. According to climatologists, the weather process development this winter is similar to the winter of 1965-1966. Statistics show that rather warm springs follow warm winters in seven out of ten years.

According to the USSR Hydrometry Center calculations the first calendar month of this spring is also expected to be comparatively warm in most oblasts. The lowest temperatures over most of the republic's territory will be close to 1 - 3 degrees

frost, the highest 6-11, and on the southern coast of Crimea up to 14-20 degrees heat.

The monthly precipitation level in Odesskaya, Nikolaevskaya, Khersonskaya and the steppe rayons of Krymskaya Oblast will amount to 25-30 mm, and on the southern coast of Crimea almost 55 mm (above norm). In Volynskaya, Zhitomirskaya, Kievskaya, Chernigovskaya, Sumskaya, Kharkovskaya, Poltavskaya, Cherkasskaya, Kirovogradskaya, Dnepropetrovskaya, Zaporozhskaya and Donetskaya Oblasts the precipitation will be 25-40 mm (close to norm). In the Voroshilovgrad, Zakarpattya, Lvov, Ivano-Frankovsk and Ternopol areas, in Chernovitskaya, Khmel'nitskaya and Vinnitskaya Oblasts the precipitation will be less than 25 mm (lower than norm).

Agricultural workers should do everything in their power to utilize the favorable weather conditions as fully and effectively as possible to give joy to the Fatherland with worthy worker gifts.

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